TAUNTON'S

# Fine WoodWorking

Add muscle to your miters, p. 52

## Stow-and-go sharpening station

Small cabinet that's big on details

Precision sanding on the drill press

Enliven edges with custom scratch stocks

Garden bench built to last

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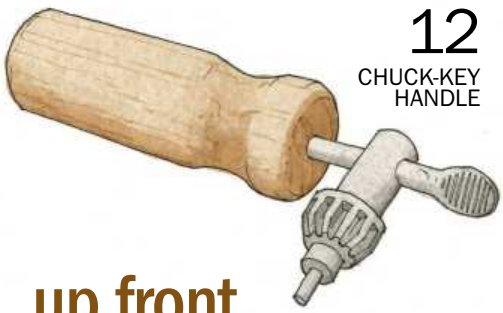

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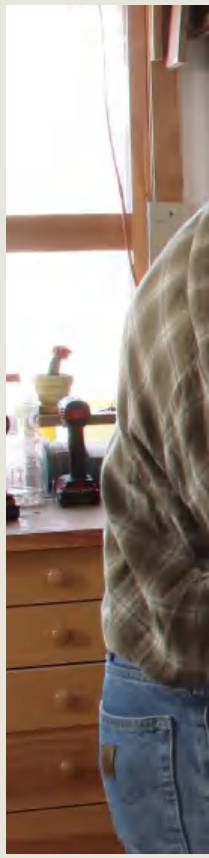

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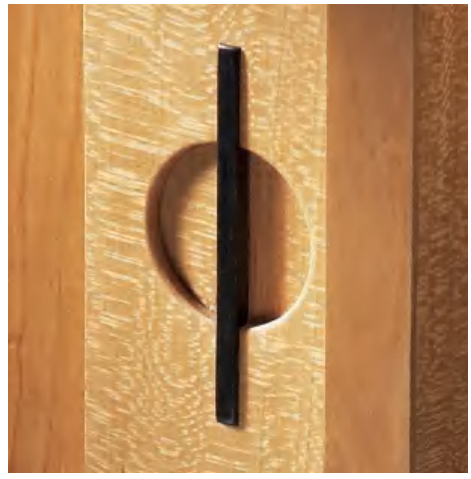

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# on the web

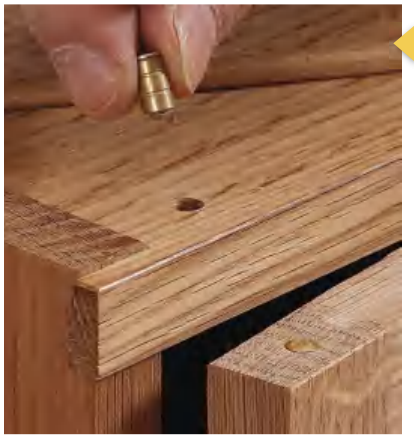
## THIS MONTH ON FineWoodworking.com/extras

**Visit our website to access free online extras, available March 30. While you're there, don't miss our collection of free content, including tool reviews, an extensive project gallery, and must-read blogs.**

VIDEO

### Get Sharp Fast

For instructor and furniture maker Bob Van Dyke (p. 44), getting sharp is the first step to doing great work. Watch as he demonstrates his step-by-step routine, which yields razor-sharp edges in minutes.



### Install a Bullet Catch

A solid-brass catch is a classy addition to any cabinet, but installing one can be tricky. Mike Pekovich (p. 30) takes the headache out of the process with a simple method that guarantees perfect alignment every time.

### VIDEO: Master the Scratch Stock

A scratch stock (p. 67) is a great tool for dressing up your work. Use it to cut a bead along an edge, or to cut grooves for inlaid stringing. Veteran furniture maker and contributing editor Garrett Hack shows you how easy it is to make your own scratch stock and put it to use.

VIDEO

### Get Unstuck from Super Glue

Super Glue (p. 60) is handy to have around the shop, but as many woodworkers know, you must be careful because it bonds to skin instantly. In this video, *FWW* web producer Ben Strano shows you what to do should you accidentally wind up in a sticky situation.

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- dress up your furniture with pierced panels

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# contributors

**Born and raised in Colorado, Brian Hubel (Master Class) began his woodworking career playing with scraps in his grandfather's shop. By high school, he had received a benchtop tablesaw for Christmas and was building furniture. Today, his two children, Oliver and Zoe, have a bench in their dad's Colorado Springs shop where they build tables, benches, and little cabins from their own box of scraps. Hubel even trusted them (after some instruction) to sand an entire veneered tabletop. Hubel says he loves his town and the mountains around it, where he and his family can ride bikes, swim, fish, backpack, ski, and climb.**

In the shop he built near his house in Holden, Mass., **Duncan Gowdy** ("Add Muscle to Your Miters") builds furniture that reflects his early interest in fine art. He began by studying illustration but switched paths to furniture making at the University of Massachusetts, Dartmouth. Now his work often blends realistic relief carving with functional furniture forms. Gowdy earned a master's in furniture design at San Diego State University. Before launching his furniture-making career, he spent six years building timber-frame houses. These days he splits his time between building furniture and caring for his son, Carter.

**Jessica Wickham** ("Cedar Garden Bench") started her business, Wickham Solid Wood Studio, after five years spent living and working in Tokyo, where she discovered Japanese woodworking techniques and blacksmith-made edge tools. **Nic Meehan**, a fabricator in her four-person studio who helped build the bench for her article, is a recent Vassar College graduate. Wickham's business specializes in designing and building "warm minimalist" furniture using Northeastern hardwoods and sometimes specialty woods, like the Port Orford Cedar used for the bench.

**Garrett Hack** ("Make Your Own Scratch Stocks") loves working with his hands. As such, he's living his dream as a woodworker and farmer. A furniture maker of more than 40 years, he has created his own aesthetic, with award-winning designs that push his skills to the next level. He's also an in-demand woodworking instructor, who teaches all over the world. Hack has a great love of hand tools, and uses them to great effect as he builds, sculpting delicate details by eye. He works in a cozy shop on a working farm, where he also uses his hands to tend his abundant gardens and orchards.

For more information on our contributors, go to FineWoodworking.com/authors.

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# letters

## From the Editor

### SO LONG, GENTLEMAN JIM

All year we've been celebrating *Fine Woodworking*'s 40-year anniversary. With our ongoing tool giveaway and throwback features online and in print, it's been quite a party.

But our 40th is tinged with a bit of melancholy, with the exit of longtime Methods of Work editor and illustrator Jim Richey (see Looking Back, p. 88). A fixture with the magazine for 36 years, Jim has worked with readers and editors to churn out hundreds of clearly illustrated woodworking tips. He has been a consummate pro, always meeting his deadlines without fail, with an easygoing personality that made Methods a dream department for any editor.

More than an illustrator and editor, though, Jim has become family. Always will be. And because he *is* Methods of Work, I've decided to retire that department name with Jim's retirement.

We will, of course, continue to bring you the best shop tips, under a new name and with a new team. Beginning with our next issue, Dan Thornton, a longtime illustrator and former deputy art director for *Fine Homebuilding* magazine, will man the drawing board. Asa Christiana, former editor of *FWW*, will gather the tips and polish the words to perfection.

Yes, we're moving forward. But Methods of Work and the legacy of Jim Richey will always be etched in our rear-view mirror.

Happy fishing, Jim. And thanks for everything.

—Tom McKenna, editor

**Convert to metric, please**

I've been an online member of *FWW* since December 2013, when my son gave me a subscription for Christmas. As an amateur woodworker, I couldn't have received a better present. Your photographs and drawings are top quality, the descriptions are models of clarity, and every one of the contributors is a craftsperson of amazing skill. Not to mention all the extras available, such as classes and video workshops.

I have one gripe, though: When, oh when are you going to convert to metric? All those 32nds of an inch are torture to someone used to millimeters!

—DENIS SOLOMON, Lima, Peru

**What about helical cutterheads?**

I've just finished reading issue #253 and was particularly interested in the benchtop planer tool-test article. Kelly Dunton confirmed my feeling that the DeWalt 735 is the best machine of its type on the market. I acquired one secondhand years ago and it's still going strong.

I have one issue. In his discussion about straight knives vs. segmented knives, while he's no doubt accurate in his assessment of the tested machines, he ignores an important aftermarket option. Several years ago I had a Byrd helical head installed in my machine. The Byrd head has the knives mounted at an angle so they slice into the wood. The planer cuts noticeably better than before the conversion and, for whatever reason, is dramatically quieter.

I realize that this is an expensive option that's not for everyone, but I believe your readers should not be left with the impression that segmented knives aren't worth it. I'm a convert and others may be as well.

—RALPH VITALE, Boxford, Mass.

**Editor replies:** For the review, we wanted to test the planers as they came equipped from the factory. However, we did a tool test in 2012 on aftermarket helical cutterheads that confirms your experience ("Segmented Cutterheads Change the Game," *FWW* #223, pp. 38-43).

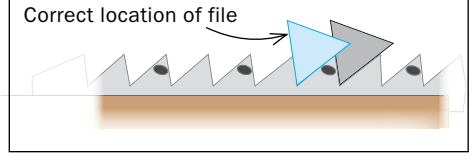
**Long-bed lathe**

I want to thank *FWW* for featuring Carlisle Lynch's plans for a long-bed lathe in the Looking Back segment of *Tools & Shops*. I fell in love with that lathe when I first read the original article back in 1986. I saved that issue for years with the intent of building a copy of Lynch's lathe. Somewhere along the way the stack of magazines and Lynch's article disappeared, recycled or given to a younger beginning woodworker. The Looking Back article highlighting Lynch's lathe reignited my interest in building a long-bed lathe, and now it's finished.

—STEVE BUNN, Bowdoinham, Maine

**Correction**

*In a recent Handwork ("Sharpen your own backsaw," FWW #250), we made an error in the illustration on p. 84 that shows where to place the file in relation to the saw's teeth.*



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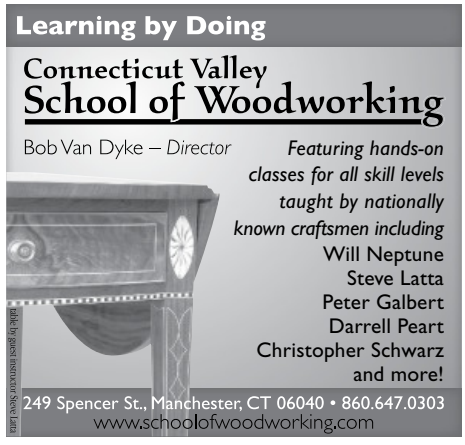
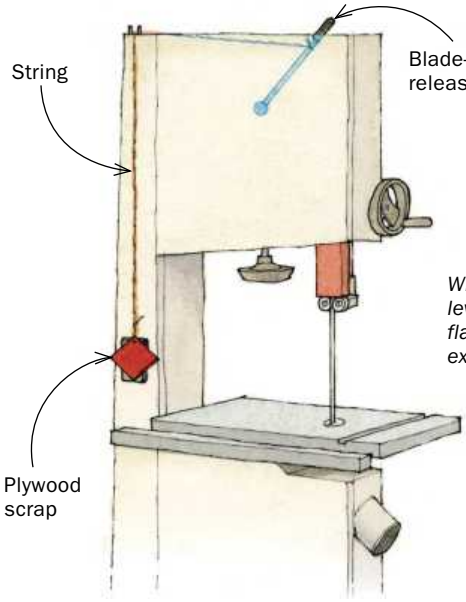


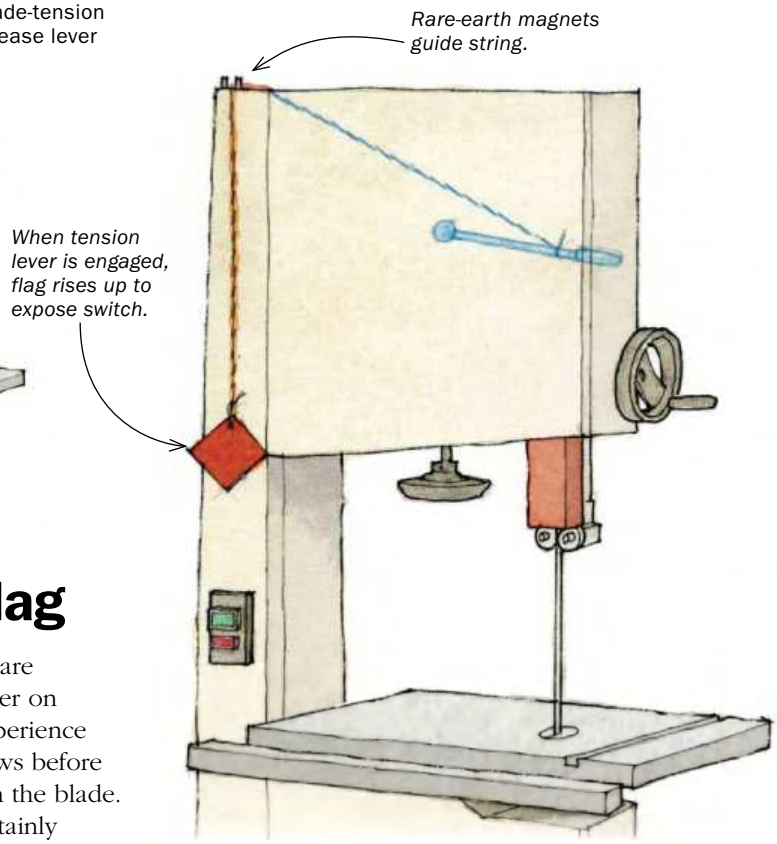
# methods of work

EDITED AND DRAWN BY JIM RICHEY

## Best Tip

**Growing up on a farm in England, Jo Jesty learned to fix and build things. While employed as a college professor and medical researcher in the United States, he built plenty of furniture. He also built and sold a trebuchet that fired pumpkins 400 ft. "It was hard to find space in my neighborhood to use it," he says.**



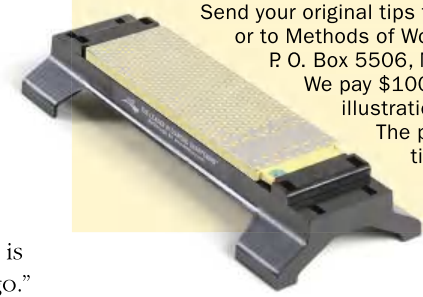

## Bandsaw tension flag

Many modern bandsaws, including mine, are equipped with a blade-tension release lever on the back of the machine. I know from experience that it is all too easy to start these bandsaws before remembering to pull the lever and tension the blade. Although there's little danger, you can certainly wreck a blade and gouge the tires. Here is a quick, effective fix.

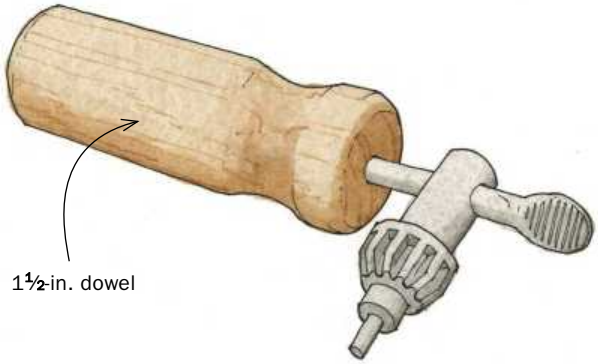
With the blade tension released (lever up), I ran a length of string from the lever handle over the top and down the other side near the switch. I tacked the string to the lever with cyanoacrylate (Super) glue so it won't slip down. Then I placed a couple of rare-earth magnets on the top of the frame to guide the string. Finally, I tied a scrap of plywood (a card would also work) to the string so that when the blade tension is released, the flag drops and covers the on/off switch. When the tension lever is engaged, the flag rises up and says "all systems go."

—JO JESTY, Mount Sinai, N.Y.

### A Reward for the Best Tip



Send your original tips to fwmow@taunton.com or to Methods of Work, Fine Woodworking, P. O. Box 5506, Newtown, CT 06470. We pay $100 for a published tip with illustration; $50 for one without. The prize for this issue's best tip was a DMT DuoSharp sharpener with base.




### Add a handle to an awkward chuck key

Because the chuck key is so small and short, releasing a bit from my drill press stresses my wrist and fingers more than anything else I do in the shop. My simple solution was to add a small wood handle that gives me much better leverage and a comfortable grip.

I cut a 4-in. length from a 1½-in.-dia. dowel, drilled the right-size hole in one end, and shaped the handle with a rasp and sandpaper. It works like a charm.

—PATRICIA ROBBERT, Franklinton, La.

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## Bicycle-tire sharpening wheel

During my 72 years, mainly through trial and error, I've found certain methods that work well for me. One example is this sharpening setup made from a bicycle wheel.

Start with the complete front wheel and fork. I used a 26-in. by 2.125-in. tire. Mount the wheel assembly on a base so that its tire contacts the pulley (1½ in.) of a ¼-hp, 1,725-rpm motor. Your wheel should revolve at about 100 rpm, with a surface speed of 650 ft. per minute. Now glue a strip of abrasive cloth to the tire surface, and you have a very efficient, low-cost grinding wheel. Use it so the sparks fly away from the tool. Because the speed is slow and the wheel is large, there is little heat buildup to burn a tool and ruin the temper. If you place the whole assembly on a bench, the work area will be at eye level.

As a companion tool I use a belt-driven mandrel fitted with five side-by-side, 6-in. muslin buffing wheels. I charge this thick buffing sandwich with 1,000-grit abrasive, which gunsmiths use to polish gun barrels prior to bluing. I then polish all edge tools to a mirror-sheen, razor-sharp edge. The whole system is inexpensive and can be mastered by any flub-dub.

—RAY "PAPPY" HOLT, Tampa, Fla.

CELEBRATING 40 YEARS

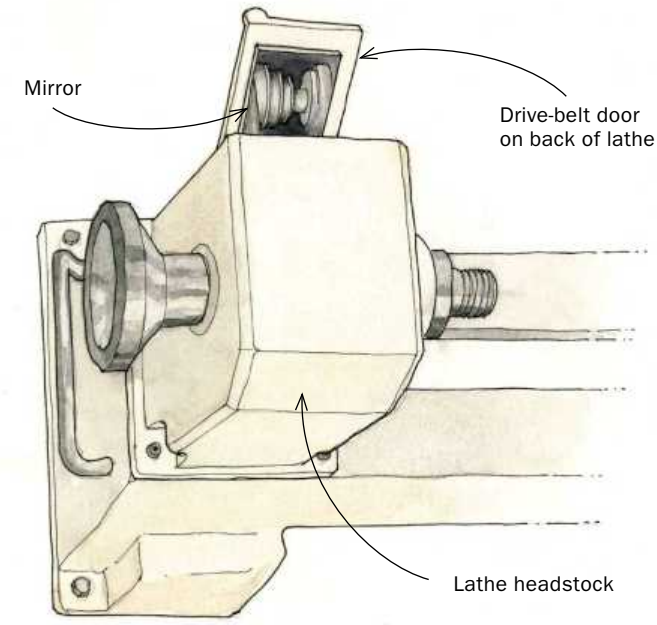
### Classic Tip

**To mark *FWW*'s 40th anniversary year, we are presenting some classic Methods of Work tips. This tip from *FWW* #41 shows how inventive our readers can be.**

## Mirror makes belt changes easier

Some of my power tools require moving the drive belts by hand to change the speed. This is fine with me, except on some tools, like my lathe, I almost have to stand on my head to see into the small opening for speed changes. I solved this problem by cutting a small mirror and attaching it to the inside of the drive-belt door with double-sided tape. This makes it easy to see the belts, so I can change the speed and line up the belts properly.

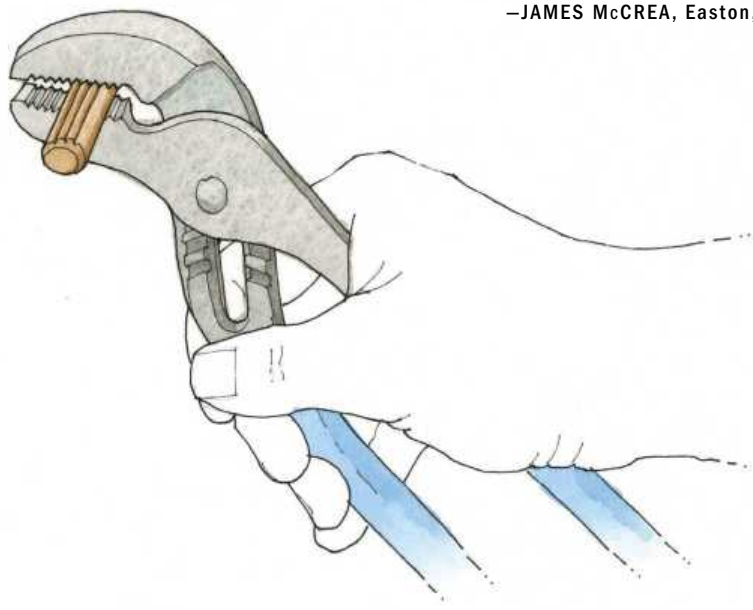
—BILL WELLS, Olympia, Wash.




## Use pliers to slot dowels for glue

Nicely fitting dowels need at least one slot down the side to release air and excess glue when you drive them in. To quickly make a few slots, grab a pair of groove-joint pliers and squeeze along the length of the dowel. A single pass will create two or three grooves on either side, just right for the job.

—JAMES McCREA, Easton, Md.



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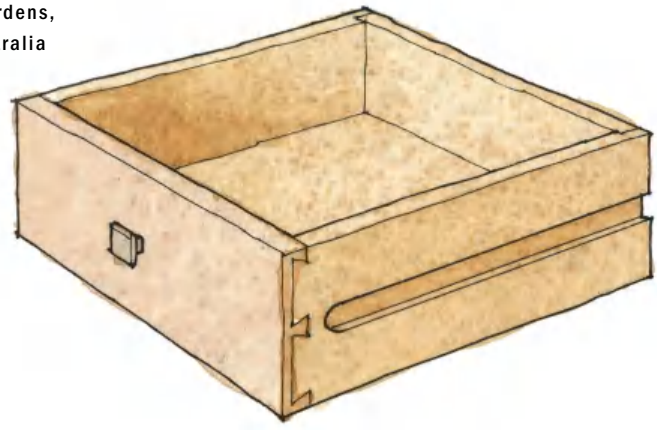
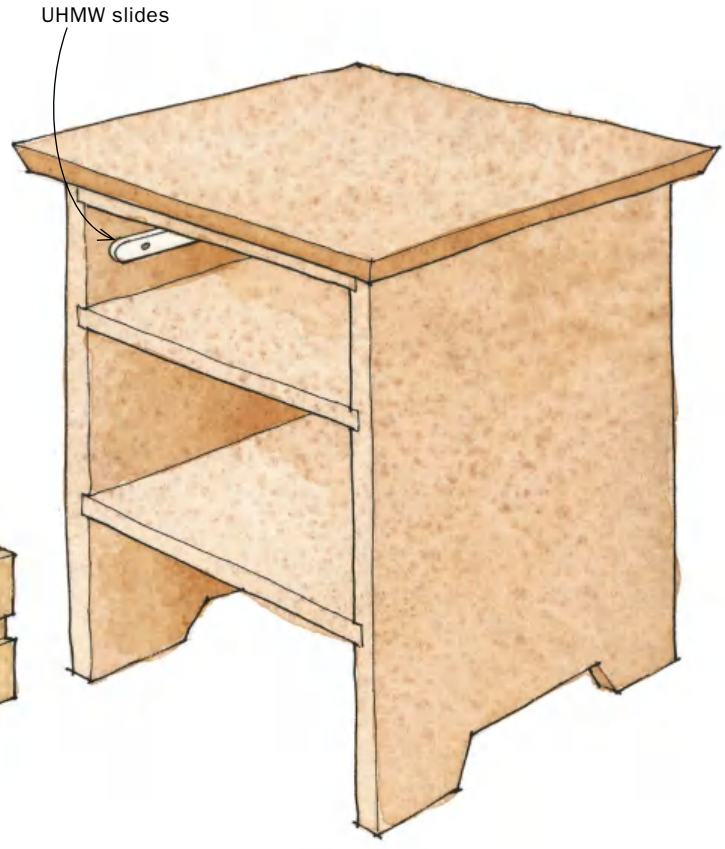
## Side-hung drawers ride better on UHMW plastic

I've made several cabinets with side-hung drawers like the ones Michael Cullen demonstrated in Master Class, *FWW* #247. Rather than using wood for the slides, however, I use ultrahigh molecular weight (UHMW) plastic. Yes, this stuff is a little pricey by comparison, but the action is silky-smooth and eliminates the need to lubricate the slides with wax. The plastic slides work exceptionally well with heavy drawers, such as you would have in a tool cabinet.

—DERRICK HASTEROK,
Windsor Gardens,
S.A., Australia



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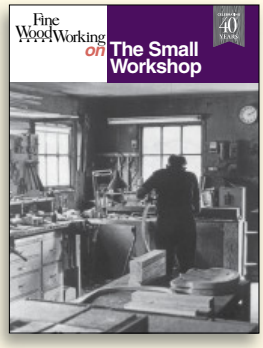


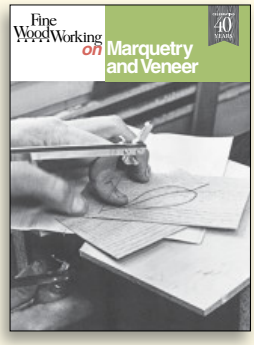


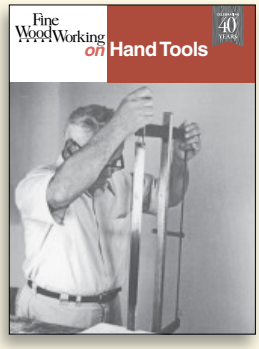


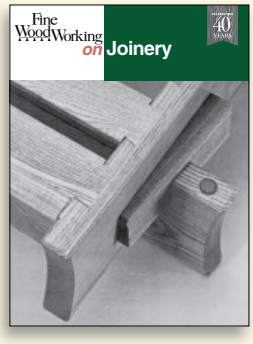


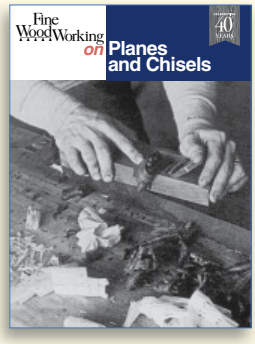


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**ACCESSORIES**

# Hold-downs improve tablesaw safety

**WHEN RIPPING AT THE TABLESAW,** it can be difficult to keep the stock tight against the fence, especially long, heavy boards. Push sticks and featherboards help, but Jessem Tool Company makes a fence-mounted hold-down that works better at controlling boards during ripcuts.

Called the Clear-Cut TS Stock Guides, this system features two urethane wheels mounted to a spring-loaded arm that's anchored to a T-track attached to the rip fence. (Jessem provides the mounting hardware.)

The spring tension on the hold-down arm allows boards to feed easily under the wheels while keeping them tight against the table. The wheels are canted 5° toward the fence to help pull the stock toward it. They rotate in one direction only, which prevents boards from being pushed back by the blade's rotation. The wheel and arm assemblies lock down anywhere along the T-track, and can be moved as close to the fence as ⅜ in. and as far away as 3 in. When not in use, they pivot out of the way and store on top of the fence. Overall, the guides do an amazing job of holding down boards.

*—Roland Johnson is a contributing editor.*

**Clear-Cut TS Stock Guides by Jessem**
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Photos, except where noted: staff; this page, top two: Roland Johnson

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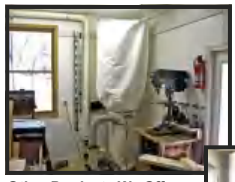

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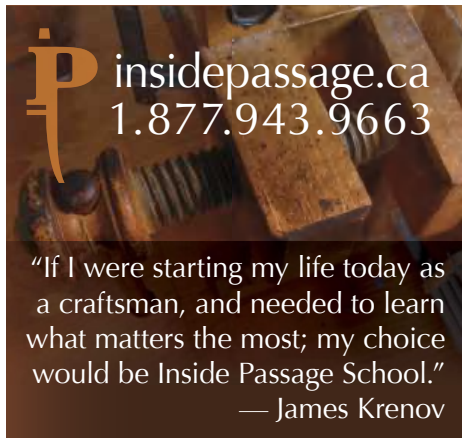
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Dust extraction through the eight-hole base pad is very good. The sander has an electronic switch that prevents operation without a vacuum attached. This can be a good thing, because all power sanding works better with dust extraction. However, you can turn off the switch should you find yourself in a situation where you can't hook up the sander to a vacuum or dust-collection system. Don't have a Festool dust extractor? No worries, Festool hose No. 452879 ($93) allows you to hook into standard shop vacuums.

*—Tony O'Malley is a professional furniture and cabinet maker in Emmaus, Pa.*

**Random-orbit sander by Festool**
**Model:** ETS EC 125/3 EQ
**$385**

■ ACCESSORIES

# Affordable blade cuts smoothly

**I ALWAYS USE A CROSSCUT BLADE** when cutting miters at the tablesaw. They leave smoother surfaces than combination blades, which makes for a tighter joint. I also use a crosscut blade when cutting plywood. For the past few months, I've been using Freud's 10-in. cabinetmaker's crosscut blade in my shop and it's done a very nice job. The blade's 60 teeth leave a smooth surface. Miters I've cut with it have all closed tightly with barely a visible glueline. Plywood edges have come out smoothly, too. The blade has even done a good job with plywood that's been skinned with very thin commercial veneers and shopsawn veneers—no tearout on the bottom face. The cabinetmaker's crosscut blade is far less expensive than the 80-tooth blade I normally use, making it a great value to boot.

*—Matt Kenney is special projects editor.*

***Smooth cuts on a budget.*** *With 60 teeth tuned for crosscuts, Freud's cabinetmaker's blade leaves a neat surface in its wake.*

**Cabinetmaker's Crosscut blade by Freud**
**Model:** LU73R010
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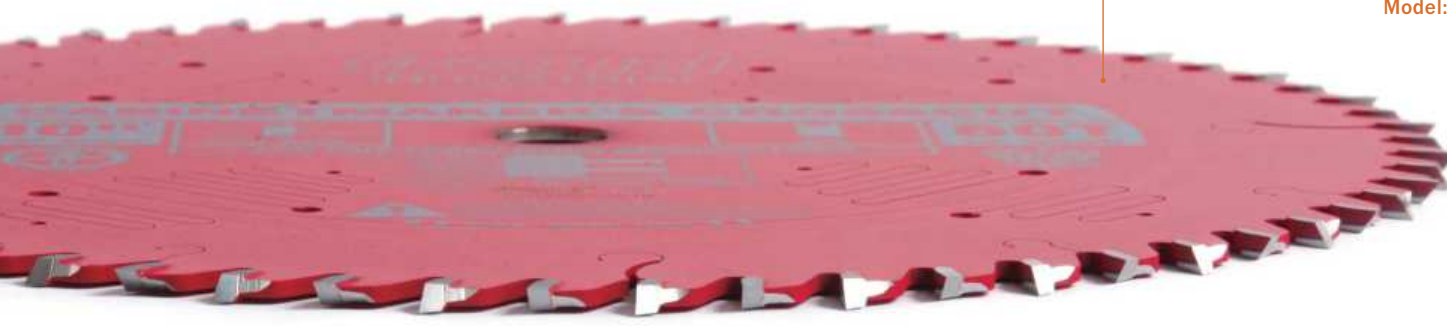

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# Stretching the Windsor tradition

BY PETER GALBERT

When I first delved into green-wood chairmaking from a life in cabinets and tables built mostly by machine, it was clear that I'd found my way to the work that I had been looking for. It wasn't so much the Windsor aesthetic that drew my interest as it was a desire to work quietly and closely with the material and tools. Once I began working primarily with hand tools, splitting logs and using steam bending, the road seemed to open in front of me.

I then spent years building traditional Windsor chairs to hone my skills and understand the techniques. Soon, curves and angles that had seemed taxing in my former world of sheet goods and milled lumber became easy to conceive and execute. But I wanted to push the design end, to make chairs that were less expected, yet still rooted in the brilliant Windsor technology.

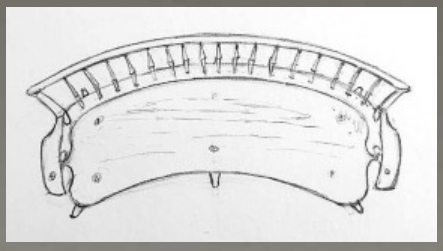
In the spring of 2008, when I was invited to enter a piece into a show at the State University of New York at Purchase, it seemed a great opportunity to try some of the ideas that had been percolating as I built traditional chairs. I'd seen a curved settee in a book on Windsor chairs years before, and the notion had been knocking around in my head ever since. I thought it would be fun to build my own curved settee. For me, new chairs usually go through an evolution of multiple prototypes, but with the show just a few weeks away, I had no choice but to nail down the settee design quickly.

As with most of my chairs—and Windsors in general—the settee's structural anchor was the seat, and that was also the starting point for the design. The only concept sketch I did was from directly above; I figured that the shape of the seat was such a dominant feature that all the other elements would fall into place around it. Once I had worked out the shape, it was a matter of finding the angles of the legs and posts that join to it. Chairs built this way end up being a kind of puzzle, with certain key elements, such as the side posts, dictating the general shape, and the rest of the parts connecting the dots. In building traditional pieces I'd acquired a toolbox of techniques that made this clear, and as I made my way through the settee, each step and result seemed very natural and obvious.

Some new challenges did present themselves, such as the curved stretcher system beneath the seat. To find the geometry of the joints, I made a full-scale drawing showing the stretchers that run from the front legs to the back legs. Then I was able to map out the curve of the center stretcher.

I also ended up changing the splay of the legs to improve the stance. When I had the leg holes partly reamed, I inserted the

Photos and drawing: Peter Galbert



legs and saw that for this form the front legs weren't splayed enough and the back legs were splayed too much. So I changed the angles as I finished reaming—a great example of the freedom this technology gives you to change a design as you go.

With the settee built, I was pleasantly surprised at the results and set about painting it. Most of my previous chairs had been painted dark, using black milk paint layered over red, which was well suited to traditional designs. But I had been thinking I might paint the settee a bright organic color to complement the flowing nature of the design. With the deadline looming, however—and well aware that the finish can either elevate a design or cruelly diminish it—I decided not to take the risk. I painted the settee black over red.

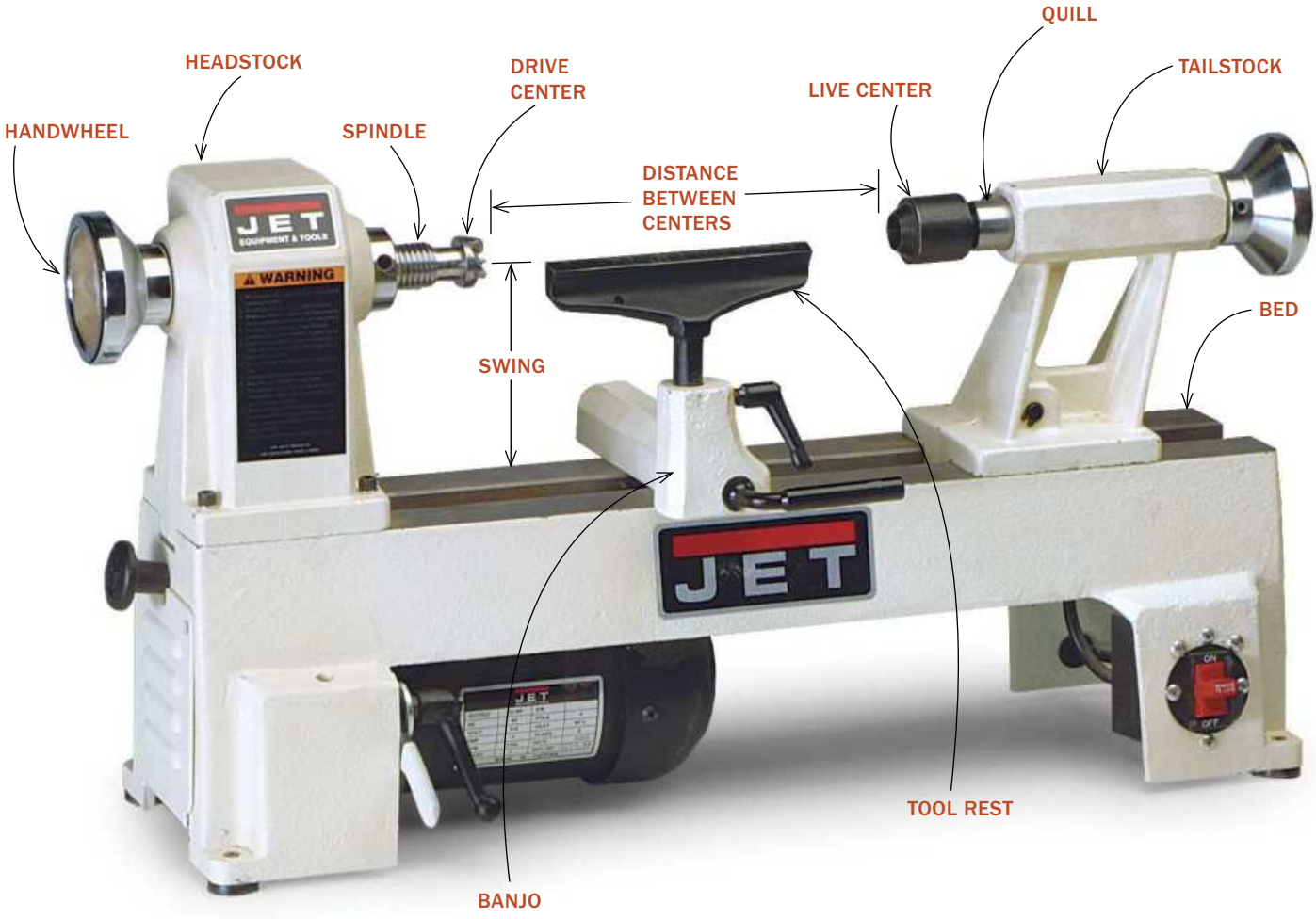
As soon as I stepped back from the painted piece I realized that I'd chosen very poorly. Under dark paint the settee was not just subdued, it was dead. I spent the next day and a half carefully washing away the paint so as not to destroy the tool marks underneath. The seat got a fresh scraping and I repainted, layering green milk paint over yellow. The paint seemed to impart just the note of botanical freshness I'd been hoping for, and a few days later my newly named Spring Settee was on view at Purchase. □

*Peter Galbert designs and builds chairs in Roslindale, Mass., and teaches chairmaking classes at North Bennet Street School in Boston.*

# The language of turning

## DEMYSTIFYING ONE OF WOODWORKING'S OLDEST TRADITIONS

BY MIKE MAHONEY




Wood turning is one of the fastest-growing segments in the realm of woodworking-related hobbies, but to get started, you must understand all the unique equipment, tools, and terminology turners use. That can be daunting. Here I'll walk you through the essentials, starting with the lathe.

### Understanding the lathe

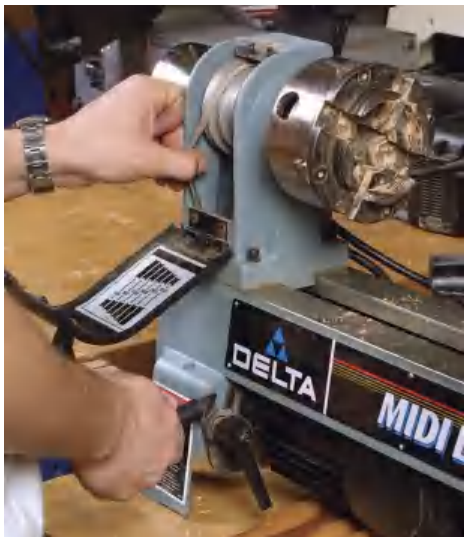
The wood lathe is a fairly simple machine with only a few moving parts. Different-size machines are available, from mini and midi benchtop models to monstrous floor-standing beasts. A lathe's physical dimensions correspond directly to its swing and distance between centers, which describe the maximum diameter and length, respectively, of material it can handle.

The heart of the lathe is the headstock, which houses the pulleys that attach to the motor and the spindle. The spindle is the threaded section that protrudes from the headstock and holds the work. Spindles typically have a common diameter and thread count so that third-party manufacturers can make chucks and faceplates to fit any lathe. They are typically hollowed to accept Morse-tapered tools such as chucks and drive centers.

Most turning is done on the right, or inboard, side of the headstock. The left, or outboard, side has a handwheel that is used to turn the spindle manually. On some lathes, the handwheel can be removed for outboard turning of bowls and vessels that exceed the swing, or capacity, of the lathe. On some



Photos: staff




*You need to **change speed** based on the project size and material. To do that on most lathes, change the orientation of the belt drive.*

*The **spindle** transfers power. It is the driven portion of the lathe and can accept all manner of accessories, like a chuck (shown) or drive center, via its threaded shaft or Morse taper.*

machines, the headstock can rotate for the same effect.

The tailstock sits opposite the headstock. It consists of a quill, or barrel, hollowed to a Morse taper to accept a variety of centers. It is used to hold work to the headstock when turning spindles between centers, which includes long items like table legs. The tailstock's live center engages an end of a workpiece (spindle) and secures it against the headstock's drive center.

The lathe bed, or ways, is the track that aligns the headstock and tailstock. The tailstock slides back and forth in line with the headstock to change the distance between centers.

The tool rest supports hand tools while turning and is attached to the bed via the banjo. It's fully adjustable between the head- and tailstock to provide a stable work surface in any position.

### A look at accessories

In addition to the basic components of the lathe, there are a host of other attachments with specific purposes. These include faceplates, four-jaw chucks, vacuum chucks, drive centers, and steady rests.

Many lathes come with a faceplate, which attaches to the spindle. The work is screwed to the faceplate from behind, then mounted on the spindle. The faceplate is used when turning bowls and other wide, flat pieces.

*A term integral to making spindles, **turning between centers** refers to turning an item captured between a drive center on the headstock and the live or dead center on the tailstock.*

***Drive centers** mount on the spindle and drive the work through a center point and gripping spurs.*

*Mounted in the quill, **live centers** spin with the workpiece and apply pressure via a hand screw against the drive center. A live center rotates on bearings with the workpiece while a dead center remains stationary.*

*Some lathes allow **outboard turning** of oversize bowls and vessels on the other side of the headstock, where the bed won't interfere.*

Chucks grab onto a turned piece, most commonly bowls and vessels, and allow the face to be turned without the tailstock intruding. A four-jaw chuck grips a tenon or mortise that is carved by the turner or otherwise attached to the workpiece. Its scrolling action allows it to grab a range of stock sizes and shapes, making it a convenient way to hold work whether between centers or off the headstock only.

A vacuum chuck is similar to a faceplate in that it is used to hold the piece flat to the headstock for face-grain turning. Unlike the fasteners used with the faceplate, the vacuum chuck uses atmospheric pressure, via a vacuum, to hold the piece.

Drive centers mount on the spindle and drive the work through a center point and gripping spurs, hence the nickname "spur drives." Typically used to turn spindles and other longer pieces, these centers are pressed into the workpiece where the spurs engage the piece.

A steady rest supports the spinning work to keep vibration from causing chatter, a catch, or a piece that comes loose. When a tool skips across the workpiece and mars the surface, it's called chatter. A catch occurs when the tool bites too deeply and gets sucked into the piece. A steady rest mounts to the bed and uses adjustable rollers to engage the workpiece—whether it's a long spindle or a bowl—and dampen vibrations.

### Tools of the craft

Turning tools may look like standard bench tools, but they are each specialized to do a specific set of tasks.

Gouges are similar in shape to traditional carving tools, with a bevel cut into the underside of a flute. They are used bevel down to take shavings as the piece rotates on the lathe. A bowl gouge has deep flutes and is typically used for face grain and bowls. A spindle gouge has shallow flutes and a long grind to get into tight spaces, usually

*Much like a faceplate (below), **four-jaw chucks** are an alternative holding method. They grab the bowl or vessel with clamping jaws, either grabbing onto a turned tenon (top) or expanding into a turned mortise (above).*

*Bowls and vessels also can be turned using a **faceplate,** which screws to the face of a blank and mounts to the headstock spindle.*

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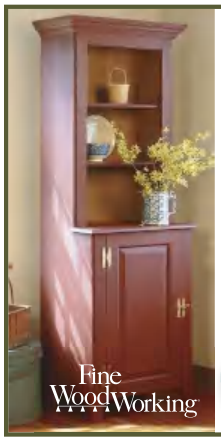

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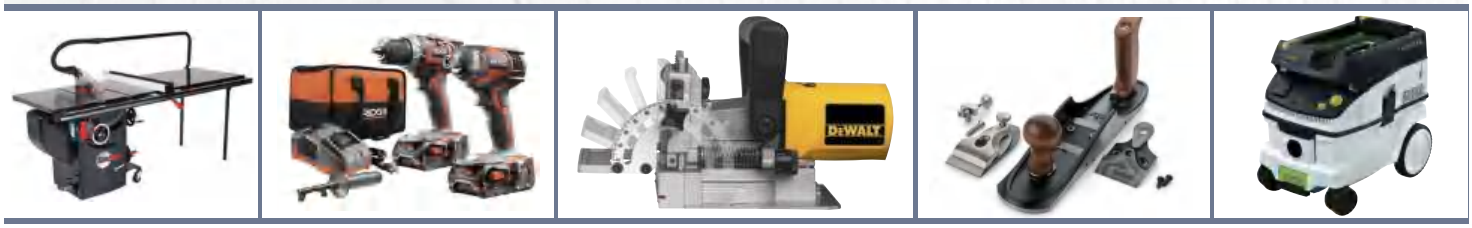


when making beads, coves, and other details found in spindle work.

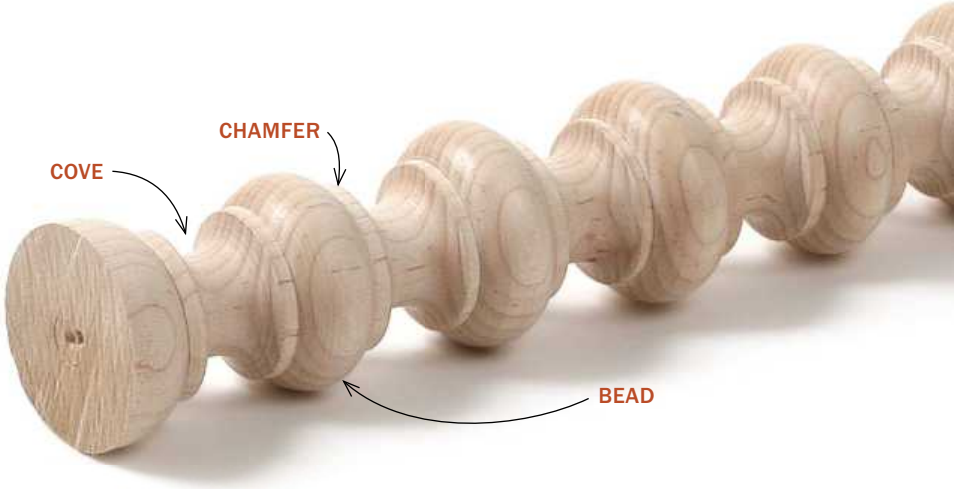
A skew chisel is used in spindle turning to plane, roll beads, make V-cuts, and scrape. A round-nose scraper is a flat bar with a rounded end that has a steep, beveled edge sharpened into it. It is used to level and smooth tool marks. A parting tool is a double-beveled tool used upright in the tool rest to part or cut off the work from a spindle.

### With the lathe spinning

Most work on the lathe can be broken down into two categories: spindle turning and hollow turning. Spindle turning, as its name implies, refers to turning long pieces between centers. Hollow turning refers to turning vessels and bowls, usually using a chuck or faceplate that allows access to the end of the piece so that the hollow can be turned into it.

There is a lot involved in the actual work of turning, but the cuts can be broken down into four basic types: beads, coves, chamfers, and pommels. Beads are protruding round surfaces on turnings; coves are the opposite, concave surfaces cut into the turning. A chamfer is a transitional straight edge between two surfaces, usually sloping in a straight line. A pommel is the point where a spindle transitions from round to square. □

*Mike Mahoney is a production bowl maker and turning instructor in California.*




***Beads*** *are the raised and rounded portions of a spindle.* ***Coves*** *are the hollowed portions.*

***Catches*** *are something every learning wood turner has experienced. At the very least, they will ruin the spindle or bowl, if not ejecting the piece entirely from the lathe.*

*The* ***pommel*** *is the point where a piece transitions from a round surface to a square one.*

***Steady rest.*** *Especially in long spindle work, a steady rest can be used to help dampen any vibrations.*

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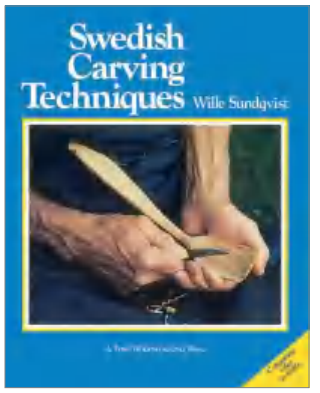


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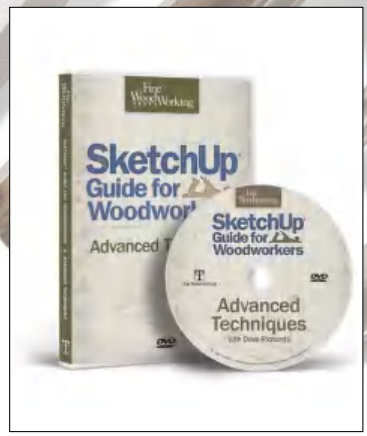


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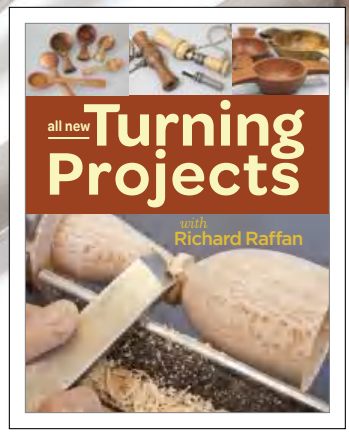


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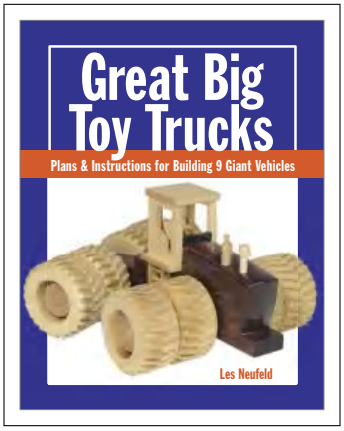


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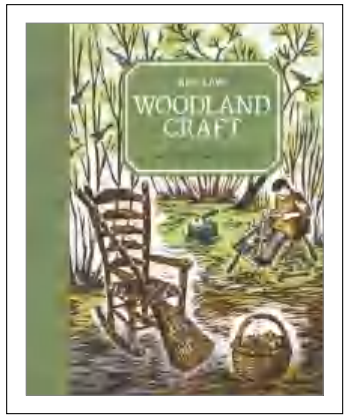


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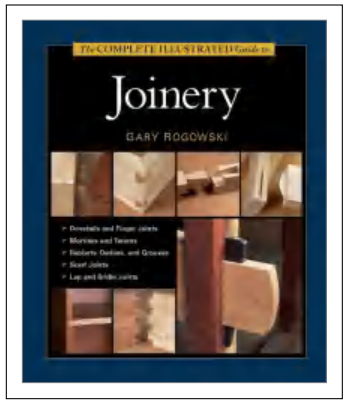


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Photo, this page: Michael Pekovich

# Small Cabinet Is Big on Details

## Proud joinery and playful shadows take center stage

BY MICHAEL PEKOVICH

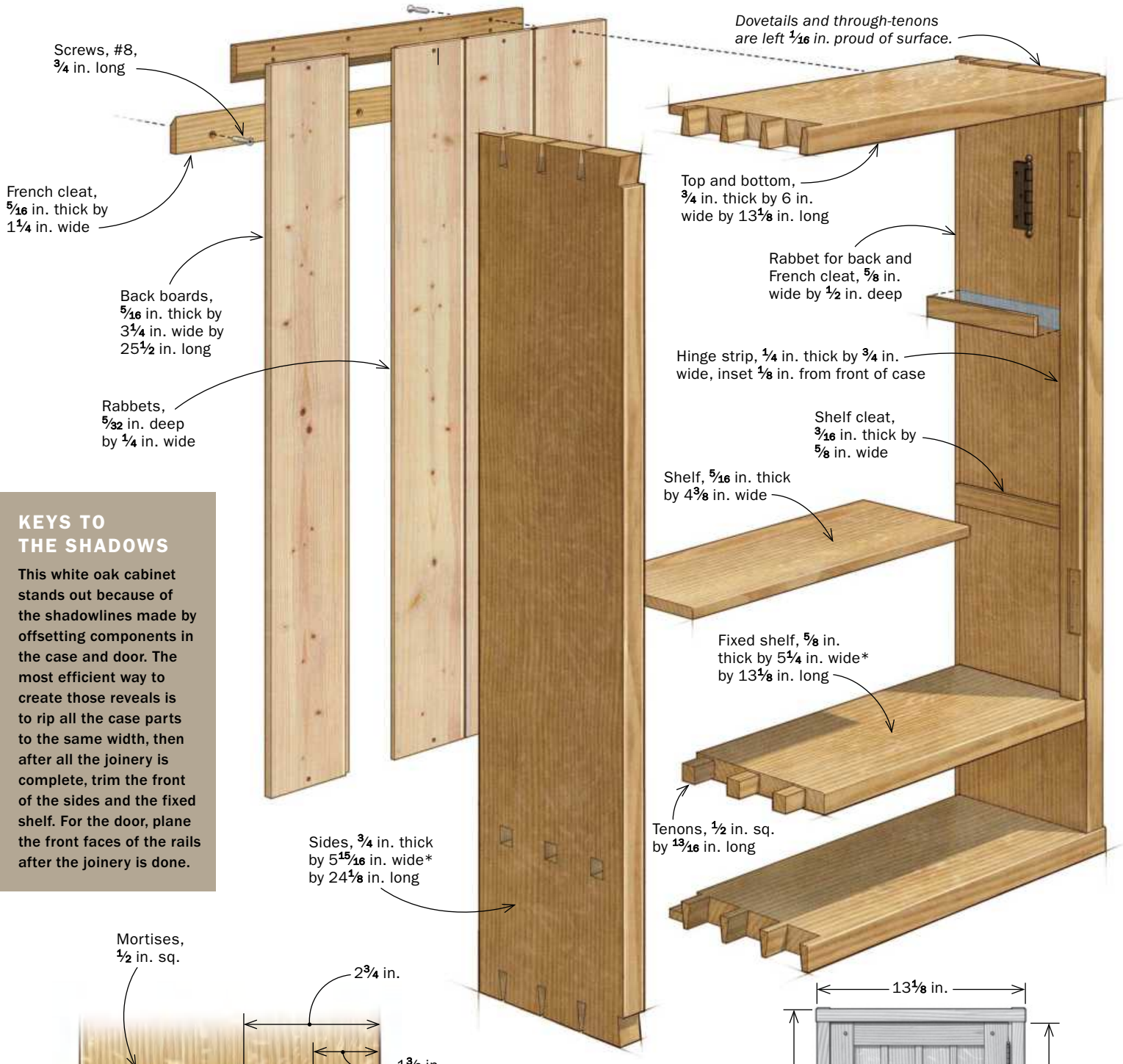
While this cabinet doesn't have over-the-top ornamentation such as moldings or veneers, it still has personality. Slightly offset surfaces and proud joinery create a quiet symphony of highlights and shadows that avoid the monotony of flush parts and make this cabinet come alive. It's a simple technique that can add interest to any casework. I'll show you some tricks for creating the offsets that don't complicate the construction.

The project is also loaded with other tips on doing more accurate work with less measuring, lessons I've been teaching my students. You'll discover that laying out joinery with marking gauges and spacer blocks instead of a ruler and pencil makes the work faster and more fun. Finally, you'll see how basic blue painter's tape ensures clean, accurate results when laying out and cutting mortise-and-tenon joints.

### Work on the case parts first

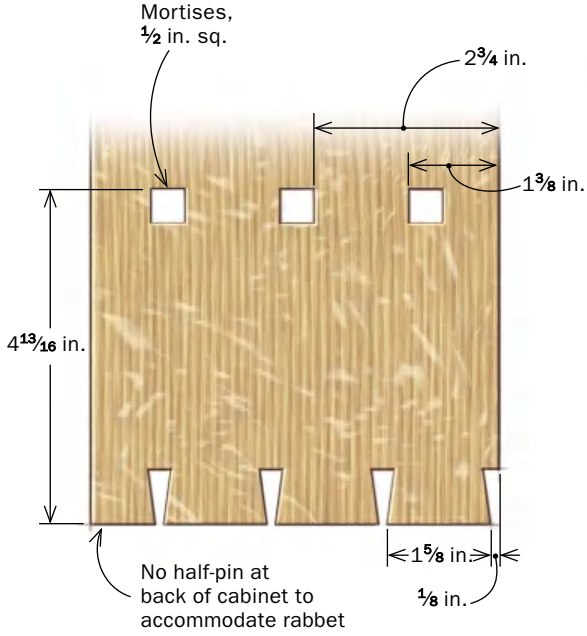
While it's tempting to mill all of the stock for a project at once, it's better to build the case first and then make the door and drawer parts to fit their openings. This technique allows for changes along the way, reduces the risk of errors, and ensures that various components fit perfectly.

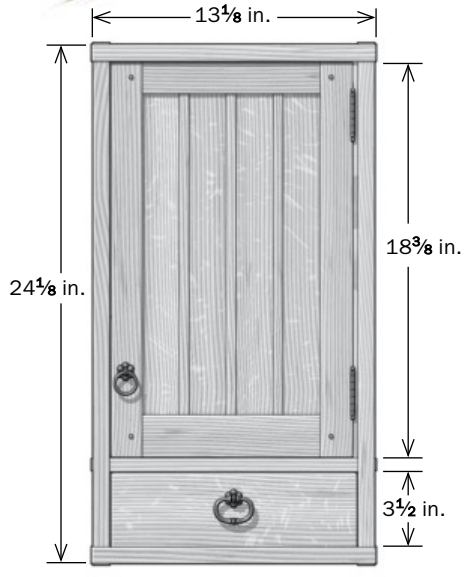
With this method, you don't have the stress of exactly matching the dimensions on the plans when milling the case parts. Just make sure that the sides are cut to the same length and that the top, bottom, and fixed shelf are of equal length. This will ensure a square, gap-free glue-up that will make it easier to build and fit the door and drawer. Also, while some of the case parts will eventually be trimmed to different widths to create the reveals, start by ripping all the parts to the same width for now. This will simplify joinery layout immensely.


Screws, #8, ¾ in. long
French cleat, 5/16 in. thick by 1¼ in. wide
Back boards, 5/16 in. thick by 3¼ in. wide by 25½ in. long
Rabbets, 5/32 in. deep by ¼ in. wide
Sides, ¾ in. thick by 5 15/16 in. wide* by 24⅛ in. long
Dovetails and through-tenons are left 1/16 in. proud of surface.
Top and bottom, ¾ in. thick by 6 in. wide by 13⅛ in. long
Rabbet for back and French cleat, ⅝ in. wide by ½ in. deep
Hinge strip, ¼ in. thick by ¾ in. wide, inset ⅛ in. from front of case
Shelf cleat, 3/16 in. thick by ⅝ in. wide
Shelf, 5/16 in. thick by 4⅜ in. wide
Fixed shelf, ⅝ in. thick by 5¼ in. wide* by 13⅛ in. long
Tenons, ½ in. sq. by 13/16 in. long

## KEYS TO THE SHADOWS

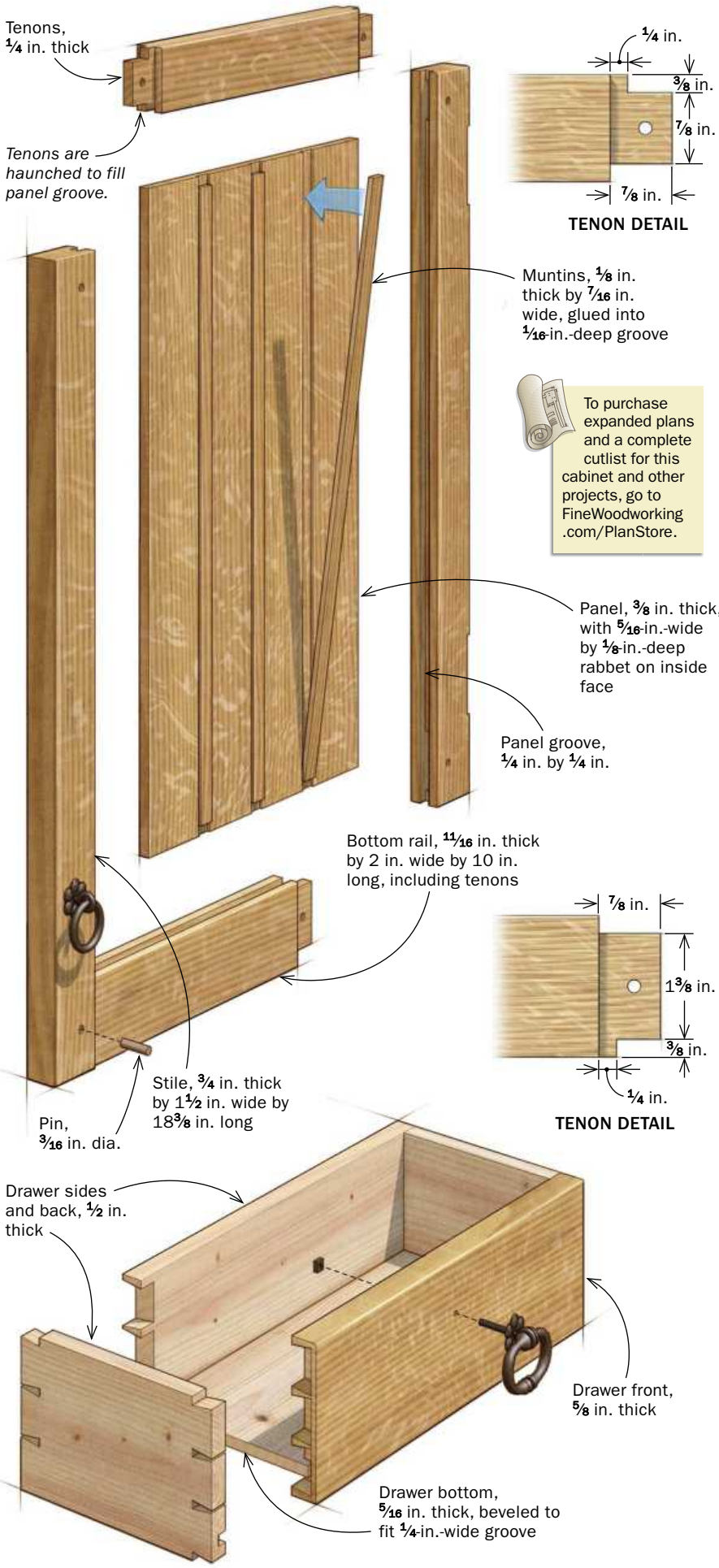
**This white oak cabinet stands out because of the shadowlines made by offsetting components in the case and door. The most efficient way to create those reveals is to rip all the case parts to the same width, then after all the joinery is complete, trim the front of the sides and the fixed shelf. For the door, plane the front faces of the rails after the joinery is done.**




***NOTE:** These parts are left at 6 in. wide until the joinery is completed. Then they are trimmed to their final width to create the reveals.*

Drawings: John Hartman


Tenons, ¼ in. thick
Tenons are haunched to fill panel groove.
¼ in.
⅜ in.
⅞ in.
⅞ in.
TENON DETAIL
Muntins, ⅛ in. thick by 7/16 in. wide, glued into 1/16-in.-deep groove
To purchase expanded plans and a complete cutlist for this cabinet and other projects, go to FineWoodworking.com/PlanStore.
Panel, ⅜ in. thick, with 5/16-in.-wide by ⅛-in.-deep rabbet on inside face
Panel groove, ¼ in. by ¼ in.
Bottom rail, 11/16 in. thick by 2 in. wide by 10 in. long, including tenons
⅞ in.
1⅜ in.
⅜ in.
¼ in.
TENON DETAIL
Stile, ¾ in. thick by 1½ in. wide by 18⅜ in. long
Pin, 3/16 in. dia.
Drawer sides and back, ½ in. thick
Drawer front, ⅝ in. thick
Drawer bottom, 5/16 in. thick, beveled to fit ¼-in.-wide groove

***Add depth to the door panel.*** *Pekovich grooves the face of the panel with a dado blade prior to assembly. Afterward, he cuts the muntins to fit inside the frame and glues them into the grooves.*

## Begin with the shelf through-tenons

The shelf is attached with through-tenons that sit proud of the case sides, a feature that adds interest and depth. To prevent gaps, your layout marks must be accurate. To ensure this (and do away with a lot of measuring), I lay out the mortises and the tenons using a spacer block and marking gauge. To make the spacer block, mill up a short length of stock to match the tenon, in this case ½ in. square.

Before working on the mortises, though, you need to cut the tenons. Scribe the shoulders of the tenons on the shelf, setting the marking gauge 1/16 in. wider than the thickness of the case sides. With the same gauge setting, scribe the baselines of the dovetail pins. Cut the tenon cheeks, matching the tenon thickness to the spacer—I use a dado blade and miter gauge. Now you can lay out the mortises in the case sides and the widths of the tenons.

When laying out through-joinery, I first lay down some blue painter's tape over the area of the joint. I scribe through the tape and peel it off the waste areas to give me a clear-cut guide for sawing and chopping. Tape the inside and outside faces of each case side at the tenon locations and on the ends of the shelf. Trim off the tape at the edges; folding it over will throw off your gauge setting.

Use a square and a pencil to mark the approximate location of the top and bottom of the mortises on the case sides. You'll dial it in later,

# Spacer is key to gap-free tenons

**A simple ½-in. spacer is the basis for all the mortise-and-tenon joinery in this piece, giving you incredibly accurate joints with no measuring.**

***Cut the tenon cheeks to match the spacer.*** *Pekovich uses a dado blade to cut the fixed shelf tenons. He raises the blade using the spacer as a guide to dial in the width.*

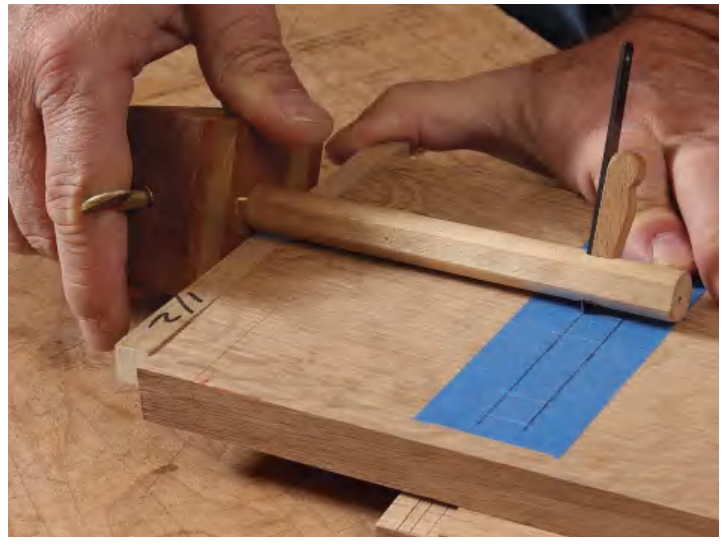
but this will provide a starting and stopping point for scribing the sides of the mortises.

Set the gauge to the inside wall of an outer mortise and scribe each face of both case sides. Use the same gauge setting to scribe the ends of the shelf tenon. Now, without changing the gauge setting, place the spacer block against the edge of the case side, register the gauge against it, and scribe the outside wall of each outer mortise. Then register the spacer along the edge of the shelf and scribe the outside wall of each tenon as well.

Now adjust the gauge to scribe one wall of the center mortise. Scribe it and rotate the workpiece, registering off the opposite edge to scribe the second wall. Repeat for the center tenons on the shelf. All that's left of the layout is to scribe the tops and bottoms of the mortises. Register the gauge off the bottom of the case and scribe the top of the mortise, then insert the block to scribe the bottom. Now peel away the tape from the waste areas. The tough part is over. It's time to cut some joinery.

***Lay out the mortises.*** *Lay out the joinery over strategically placed blue tape. Set a marking gauge for the inner wall of the outside mortises on the case sides. Scribe both the inside and outside faces of the case sides (above). Then add the spacer block between the case side and the marking gauge to scribe the outer mortise walls (right).*

***Lay out the tenons with the same gauge setting.*** *Without moving the fence, scribe the ends of the tenons as well. This will ensure perfect alignment between the mortise and tenon locations.*



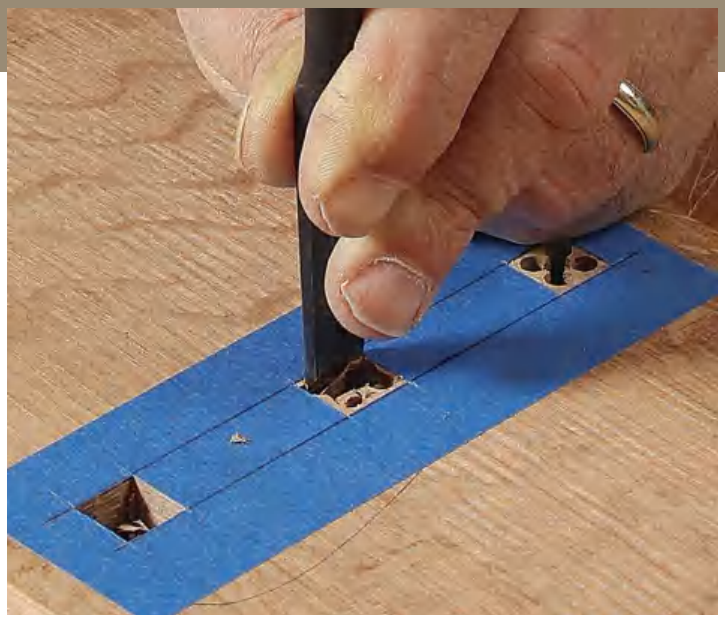
***Define the mortise height.*** *Register the marking gauge against the bottom of the case side to scribe the top edge of the mortise. Add the spacer to mark the bottom edge.*



Photos, except where noted: Dillon Ryan

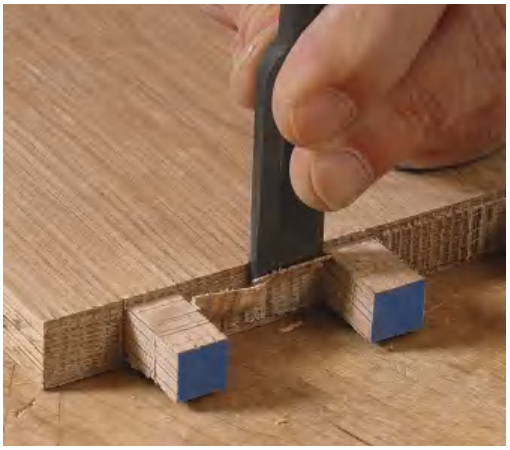
## Tape guides the handwork

**With the joinery laid out, the rest is easy. Pekovich uses the blue tape as a guide when sawing and chopping out the waste.**



***Mortises first.*** *Drill away the majority of the waste. Use a chisel to chop away the waste and then pare to the tape line, working down to the center of the mortise from one side before flipping it to cut the other side.*

***Two saws clear all the waste.*** *Use a dovetail saw to cut down to the baseline, and a coping saw or fretsaw to clear most of the material between tenons.*



***Pare to the baseline.*** *Register the back of the chisel against the tablesawn shoulder to ensure a flat surface. With the paring done, the joint should come together without gaps (below).*

For the mortises, start by drilling out most of the waste at the drill press. Then chisel to the scribe lines, working halfway in from each face. Use a backsaw to cut the tenons and cope away most of the waste between them, and finally chisel to the baseline. As long as you didn't cut into the tape or leave any waste inside of it, the fit should be pretty nice. If the joint is hanging up, make sure the tenon sides are square and there isn't any waste inside the mortises. With the shelf joinery complete, get ready for dovetailing.

### Dovetails with a twist

The case dovetails are rabbeted at the rear edge to accommodate the back. Start by laying out the tails on the case sides, skipping the half-pin at the back edge. Cut the tails and then rabbet the case sides, top, and bottom for the back before moving on to the pins. Once that's done, scribe the pins on the case top and bottom. For this I use an alignment jig, which is just a piece of ¼-in.-thick MDF with a fence glued to one edge. Position the jig along the baseline with the fence flush to one end of the case side and hold it with a spring clamp. After cutting the pins, a tab at the back corner will prevent the joint from seating fully. Scribe and cut the tab to length, sneaking up on the fit until the joint fully seats with no gaps.

With the case joinery complete, create the insets between the parts by ripping 1/16 in. off the front edge of the sides and ⅛ in. off the front of the shelf. In addition, rip ⅝ in. off the back of the shelf to allow clearance for the back boards.

### Prep and pre-finish parts for glue-up

I find it easier to chamfer the tenons and dovetails prior to glue-up. To dial in the chamfer width, I use a block plane to make a

# Dovetails with a built-in rabbet

**This twist on the traditional dovetail is a great joint for casework and eliminates the need to rout a rabbet on the back edge after glue-up.**

***Cut the tails, then run the rabbets.*** *Lay out the sides with a half-tail at the back wide enough to conceal the rabbet. Then rabbet all the case parts with a dado blade.*

light chamfer on a shelf tenon, dry-fit the shelf, and check my progress. I like the chamfer to extend almost to the case side, but never into the joint, which would create a gap. I use the first tenon as a visual guide for chamfering the rest of the shelf tenons, pins, and tails.

Once the surface prep is complete, I pre-finish the parts with a washcoat of shellac (1½-lb. cut). The shellac prevents any glue squeeze-out from adhering to the surface and protects the end grain from blotching. I sand the parts after the shellac is dry. The shellac washcoat has the added benefit of raising and sealing the grain, so once it's sanded smooth, the final finish will flow on nicely and build quickly.

When assembling the case, apply glue just to the tenons and the pins. This will keep squeeze-out from being forced

TIP

***Simple layout tool ensures a square case.*** *A fence glued to a scrap of MDF acts as an alignment jig. Pekovich clamps it along the baseline to make it easier to align parts for scribing.*

***Scribe the pins from the tails.*** *Position the case side so the alignment jig is snug against the pins board and scribe the pins. Don't forget to scribe under the rabbet as well.*

***Trim the tab.*** *For the joint to fully seat, the tab at the back must be cut back (above). This will create a seamless fit and a perfect rabbet around the entire back (right).*

# Door hanging made easy

**A hinge strip attached to the case side allows the door to be inset from the front of the case.**

***Mortise the hinge strip.*** *Trim the strip to fit snugly between the case top and shelf. Mark the door rail locations on the strip to determine the hinge locations. Then scribe and chop or rout the hinge mortises.*

***Mount the hinge strip.*** *Use a combination square to align the strip and glue it in place. Pekovich uses a 23-gauge pin nailer to tack the strip in place at the mortise locations and keep it from shifting while clamping.*

to the outside of the joint. Use just enough clamp pressure to close the joints and check for square.

## An inset door with its own reveals

After cutting and fitting the joinery for the traditional frame-and-panel door, skim 1/16 in. off the faces of the rails to create the offset from the stiles. Mill the panel to 3/8 in. thick and rabbet the edges to fit the panel groove. I added vertical muntins to the panel. Before gluing up the door, rip shallow grooves on the face of the panel. After assembling the door, glue thin strips into the grooves. Finally, pin each frame joint, leaving them 1/16 in. proud.

The door is inset from the cabinet front. Rather than mortise the case for the hinges, I mortise a thin strip and attach it to the inside face of the case side. It's easier than mortising the case and I can determine the inset of the door via the strip. Before installing the hinge strip, scrape off the shellac where the strip will sit. To keep the strip from shifting during clamping, tack it with a 23-gauge pin at each hinge location. After the door is fitted to the case, shim it so that it's centered vertically and transfer the hinge mortise location from the strip to the door. The drawer is traditional construction as well, inset to the same level as the door.

**Article Extra**
Learn about a simple way to install a bullet catch.

Before hanging the door, wipe on a few more light coats of shellac and rub out the surface with fine steel wool and paste wax. I used a brass bullet catch to keep the door closed. I finished off the case with iron hardware, which complements the design. □

*Michael Pekovich is a furniture maker, instructor, and FWW's executive art director.*

***Mark the door for mortising.*** *Trim the door to size and then use shims to center it vertically in the opening. Knife the ends of each mortise in the hinge strip and use the marks to locate the hinge mortises in the door.*

# Sanding on the Drill Press

## Custom-made sanding drums let you smooth any curve

BY MICHAEL FORTUNE

# Bang out the drum

Cut and stack a few plywood circles to make any size sanding drum. Large drums work well for smoother curves, while smaller drums get into tighter spaces.

***Cut a stack of circles.*** *To make disks (vs. holes), use a circle cutter, turning the tip of the cutter inward. Set the radius, measure from the bit to the cutter, and add ⅛ in., half the diameter of the bit. Clamp down the plywood each time, and sand the tearout off the edges of each circle.*

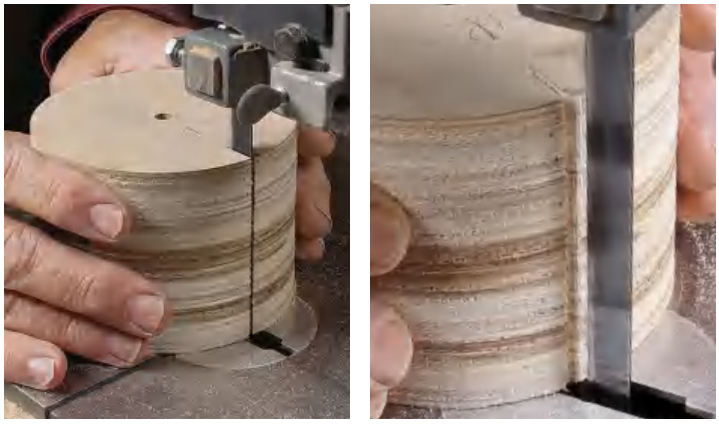
***Glue the stack.*** *Use a ¼-in.-dia. rod or drill bit to align the circles as you glue them together. Wax the rod or bit to resist glue, and try chucking it in a drill to help you insert it. With the rod or bit in place, clamp the circles into a stack.*

When I bought my first drill press, I discovered that those sanding drums that go in the chuck and accept abrasive sleeves let me sand all sorts of inside curves, whether on templates or actual workpieces. But the sleeves were available in a limited range of grits, the abrasive wore out quickly, and they weren't cheap. And the drums were too small in diameter for a lot of my needs.

So I make my own drums out of plywood disks and wrap high-quality cloth-backed sandpaper around them, attaching it with spray adhesive. I can make them any size and they work beautifully.

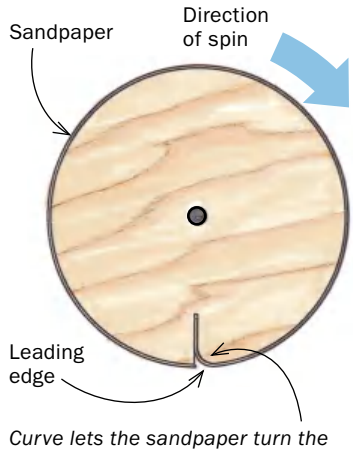
The larger the drum, the more surface area, and the longer the sandpaper lasts. Larger drums also leave a less bumpy surface. I've made drums up to 8 in. dia., though most are closer to 4 in., fitting a wider variety of curves while still leaving a relatively smooth surface.

By the way, while the bearings in a drill press are not designed for heavy sideways



***Slot it.*** *Cut a shallow slot on the bandsaw (left), to accommodate the end of the sandpaper. The outside of the slot gets a small roundover on one corner (right).*

**LEADING EDGE NEEDS A CURVE**




*Curve lets the sandpaper turn the corner without creating a bump.*

***Add a shank.*** *Fortune mounts a 5/16-in.-dia. lag screw in the drill press, rotating the chuck by hand so the lag screw enters the wood straight. Then he cuts off the head with a hacksaw.*

***Sand and seal.*** *Chuck the drum in the drill press and smooth it using a sanding block and 80-grit paper. Add varnish to make the adhesive easy to remove later. Don't use lacquer; the adhesive will dissolve it.*

# Get set to sand

## ATTACH THE SANDPAPER

Fortune uses 60- and 80-grit cloth-backed sandpaper, harvested from sanding belts and attached with spray-on adhesive.

***Mark and cut the paper.*** *Dry-fit the paper and mark its length. Then tear or cut it to size.*

pressure, as they would be in a true milling machine, they handle light to medium lateral pressure just fine.

For the sandpaper, I buy 80-grit sanding belts, made for belt sanders, from my hardware store and cut them as required. I sometimes use a lower grit to remove stock more quickly or a higher one for a smoother finish.

Sanding curves is just the beginning for these shopmade drums. I'll show you how I turn the drum into a thickness sander for thin strips, and a pattern sander for flawless curved parts. But let's start with the drum itself.

### Make your own drums

To make the drums, I cut a series of disks from ¾-in.-thick plywood. I've had good luck with a circle-cutter made by General Tools. Be sure to turn the tip the right way for cutting disks (vs. cutting holes) and use a very slow speed, under 500 rpm, if possible.

The circle-cutter leaves a ¼-in.-dia. hole through the center of each disk. To align the disks as you glue them into a stack, insert a ¼-in.-dia. rod or drill bit through the hole. Wax the rod to make it easier to remove once the glue is set.

The sandpaper goes into a small bandsawn slot. You need to slightly round the leading edge of the slot, so the sandpaper rolls smoothly into the leading edge without a bump.

Add the shank and smooth the outside of the drum as shown in the photos on p. 39. Last, varnish the outside of the drum, making it easier to clean off the spray adhesive that will attach the sandpaper.

### Sandpaper goes on easily

Cut a strip of cloth-backed sandpaper the same width as the drum. Always turn sandpaper upside down to cut it with a knife. Slip one end of the paper in the slot, wrap it

***Spray and wrap.*** *Spray a thin coat of adhesive onto the drum and paper (left), let it get tacky for a few minutes, and then wrap on the paper, starting in the groove (top) and continuing to the end (above).*

**When you are not using the drum, a few rubber bands keep the sandpaper attached until next time.**

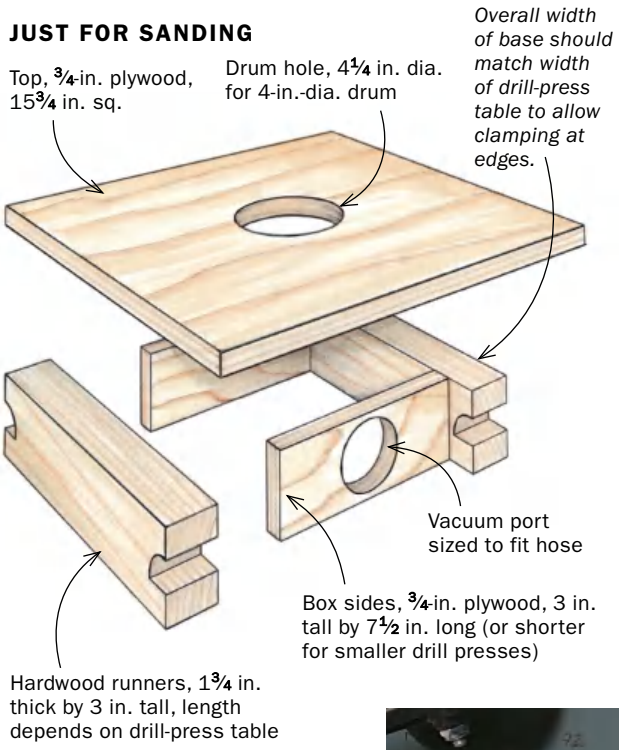


Photos: Asa Christiana; drawings: Kelly J. Dunton

## MAKE A NEW TABLE

An auxiliary table with a hole for the drum allows you raise and lower the drum to use the entire width of abrasive.

### JUST FOR SANDING


Top, ¾-in. plywood, 15¾ in. sq.
Drum hole, 4¼ in. dia. for 4-in.-dia. drum
Overall width of base should match width of drill-press table to allow clamping at edges.
Vacuum port sized to fit hose
Box sides, ¾-in. plywood, 3 in. tall by 7½ in. long (or shorter for smaller drill presses)
Hardwood runners, 1¾ in. thick by 3 in. tall, length depends on drill-press table

around the drum, mark it, and cut it to length.

Use spray adhesive, or contact cement, following the manufacturer's directions, to affix the paper snugly to the drum. When the paper wears out, just peel it off and remove the old adhesive with lacquer thinner.

### Add a simple sanding table

Some drill-press tables have room for a drum to drop below the surface, but usually not far. My auxiliary table allows the sanding drum to be positioned at a variety of heights so the entire surface can be used, extending the life of the abrasive.

Cut a hole in the center of a plywood panel, just larger than the largest drum you'll use. Next, screw on two runners that have cutouts for clamp heads. Adding two more plywood pieces, one with a large hole

***Quick setup.*** *Raise the drill-press table so the drum drops into the hole. Then clamp the sanding table in place (above) and attach a shop vacuum (left). Cut very close to the line on the bandsaw, then feed the workpiece into the drum's rotation (below) for heavy removal. You can sand the piece very lightly with the rotation to smooth small bumps.*

## PLANE THIN STRIPS

Clamping a simple fence to your sanding table lets you drum-sand material that is too thin for the thickness planer. Glue sandpaper to the bottom of the fence to keep it from shifting under pressure.

***Setup is simple.*** *Bandsaw the material close to size, and position the fence to press a piece against the drum as shown. Then remove the material, loosen one clamp, and bump that end of the fence toward the drum.*

***Against the spin.*** *Feed the stock against the drum's rotation. Otherwise it will become a tiny missile.*

for a shop-vac hose, creates an efficient dust-collection system.

### Add a fence for thin strips

Not long after I began using the sanding drum, I realized I could put a fence behind it to create smooth inlay material. Thin strips are fed into the space between the drum and the fence, always against the rotation of the drum.

The parts should be bandsawn very close to the finished thickness, say just 1/64 in. thicker, or the sandpaper will clog or burn. Use the lowest speed and 100-grit paper. After the inlay is glued in, take a first pass with a paint scraper to remove a layer of wood and any sanding grit along with it.

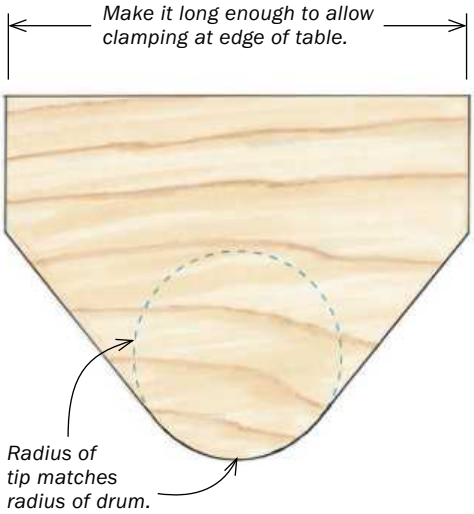
### Turn the drum into a pattern sander

Before I owned a shaper, this is how I did all of my curved

## SAND TO A PATTERN

**Add a template guide under the drum, and it becomes a pattern sander, helping you duplicate curved parts the way a shaper would.**

### PATTERN GUIDE



***Set the tip.*** *If you have bandsawn the workpiece close to the line, set the tip of the pattern guide flush with the drum. If you have big bumps or lots of waste to remove, set the tip a bit proud for the first pass or two.*

parts. Just cut the curve close on the bandsaw and then finish the job on this simple jig, which registers against a pattern. If you set it up carefully, the jig will also finish-sand a routed surface.

The pattern is attached to the workpiece in any number of ways, from toggle clamps to double-sided tape. The pattern guide is clamped to the table. Its nose has the same diameter as the drum, and it can be moved in or out to adjust the amount of wood removed.

For the smoothest surface, always choose the largest possible sanding drum (and pattern guide) that will follow the shape of your workpiece. The plywood drum will create a square, accurate edge. □

*Michael Fortune is a contributing editor.*

***Attach a pattern and sand.*** *There are a number of ways to attach a pattern to your workpiece, from double-sided tape to toggle clamps to this jig that captures the round tenons on the ends of chair parts. Feed the workpiece against the direction of the drum.*

# Stow-and-Go Sharpening Box

## Simple project works as a sharpening station and storage box

BY BOB VAN DYKE

A few years ago while giving a sharpening demonstration, I realized how disorganized my sharpening equipment was: stones, honing guides and their projection jigs, and water sprayer in different corners of the shop. Getting it all in one place took forever.

My solution was to build this box to keep it all together and give me a solid surface for sharpening. The simple splined and mitered case has a laminated top with cleats for stones and a projection jig for setting honing guides. Inside, a removable divider system keeps tools organized while remaining adaptable should your kit change.

### Make the box

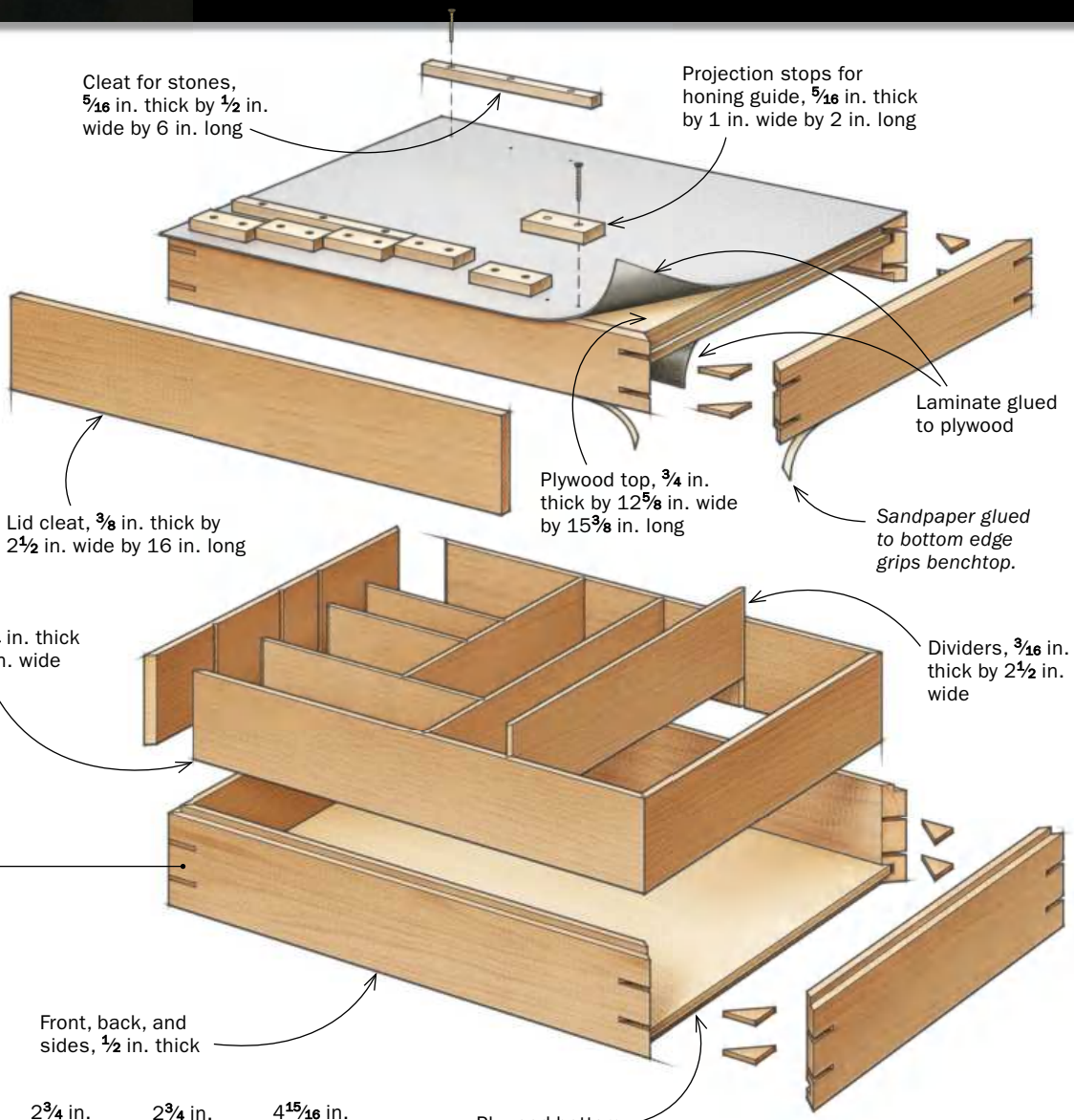
The unique feature of this case is how I cut grooves into the inside and outside faces of the sides to form a lip for the top to register on. It is easier and more precise to cut these grooves, as well as the ones for the top and bottom panels, and surface the stock before cutting any miters. I use a box-joint blade for the grooves because it leaves a perfectly flat bottom, but a good-quality dado blade would work as well. Start by ripping the offset



Drawings: Christopher Mills

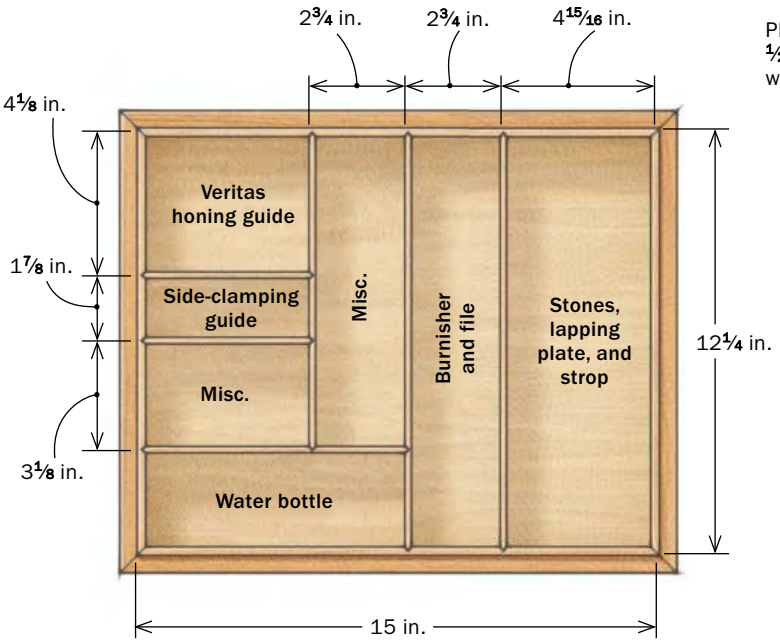
## A BASIC BOX

**This mitered box has friction-fit dividers for storing all your sharpening gear in dedicated pockets. The laminate-covered lid is used to set up honing guides and has a cleat to hold sharpening stones. A cleat on the lid keeps it against the benchtop while sharpening.**

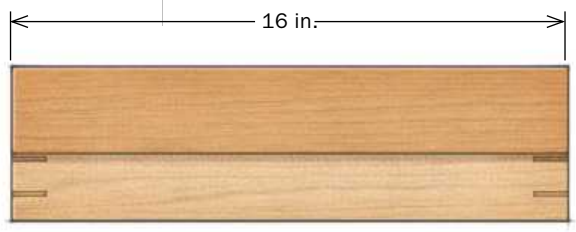

Cleat for stones, 5/16 in. thick by 1/2 in. wide by 6 in. long
Projection stops for honing guide, 5/16 in. thick by 1 in. wide by 2 in. long
Laminate glued to plywood
Plywood top, 3/4 in. thick by 12 5/8 in. wide by 15 3/8 in. long
Sandpaper glued to bottom edge grips benchtop.
Lid cleat, 3/8 in. thick by 2 1/2 in. wide by 16 in. long
Liner, 1/4 in. thick by 2 1/2 in. wide
Dividers, 3/16 in. thick by 2 1/2 in. wide
Front, back, and sides, 1/2 in. thick
Plywood bottom, 1/2 in. thick by 12 5/8 in. wide by 15 3/8 in. long

### SIZING THE BOX

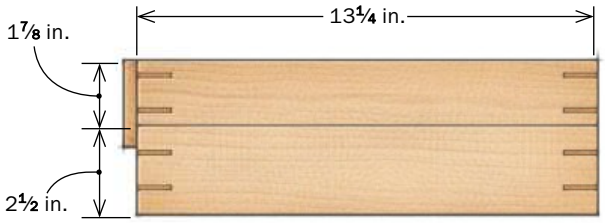
*The layout and size of the box are determined by the sharpening tools stored inside and the amount of space the stones and projection stops take up on the lid. (For Van Dyke's basic kit, see pp. 50-51.) A different set of tools requires a different layout.*




**TOP VIEW**



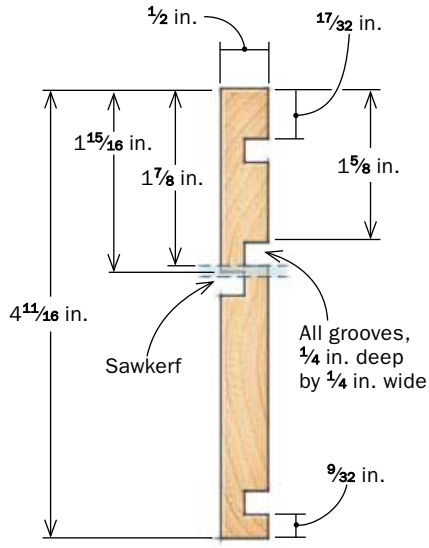

**FRONT VIEW**




**SIDE VIEW**

### GROOVES BEFORE MITERS

The box will be sawn apart after assembly to create a lip for the lid to fit over. Cut all the grooves first, then miter and assemble the box.



***Cut all the grooves before cutting parts to length.*** *The grooves for the top and bottom, as well as the grooves that will form the lid joint, are cut into long sections of the case sides with a box-joint blade at the tablesaw.*

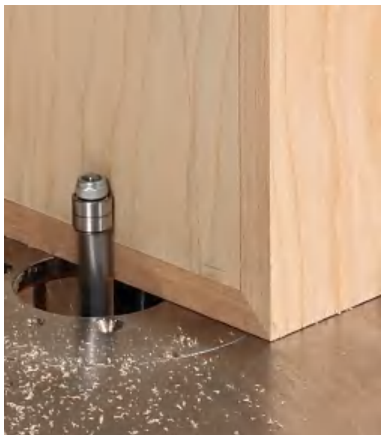
***Miter to length.*** *Cut the miters at the tablesaw. Van Dyke uses a sled and flip-up stop blocks to ensure the opposing sides are the same length.*

***Tape makes clamping easy.*** *Assemble the case pieces facedown against a straightedge, then stretch tape over each joint.*

***Glue the joints and roll it up.*** *Apply glue to the miter joints first, then the grooves. The miters will suck up most of the glue into the end grain, so apply another coat after the grooves are coated. After seating the top and bottom into their grooves, roll the case sides around the panels. Stretch the tape over the last joint and let the glue dry.*

Photos, except where noted: Dillon Ryan

## ADD SPLINES AND SAW OFF THE LID



***Trim the sides flush.*** *Use a bearing-guided, flush-trimming bit in the router table to bring the slightly proud edges of the case sides flush with the top and bottom panels.*

***Splines strengthen the corners.*** *Van Dyke cuts the spline grooves using a jig at the tablesaw and a flat-top rip blade, which leaves a perfectly flat bottom kerf. Once all the slots are cut, glue the splines and flush them with a handplane.*

***Saw off the top.*** *Align the cut carefully, being sure to take more from the inside lip than the outside. Rotate the box as you cut each side, starting with a long side and stopping before the last cut. A ⅛-in. scrap placed in the cut and squeezing pressure on the top of the case will let the box "pop" open after the last cut is made. This will keep the blade from marring the loose top.*

grooves into the inside and outside faces. Mark the location of the inside groove on the outside face for reference. Once it's glued up, those marks will help locate the cut to split the box.

Next cut the grooves for the top and bottom panels. Locate each groove so that the edges of the case sides will be slightly proud (they will be trimmed flush later). Surface both sides of the stock. To cut the miters, set the blade at 45° and test your setup on scrap until the miters close tightly. Cut the sides to length at the tablesaw and save a few offcuts—you will need them later.

Dry-fit the box using blue tape or packing tape as a clamp, and measure the inside dimensions. Cut the top and bottom to that size, adding ⅜ in. to the length and width to allow for the grooves. Now cut the rabbets with a dado blade. Check the fit with the panels in, but don't put the top and bottom in at the same time or you might not get it apart. When you're happy with the fit, prepare to glue up.

### Glue up the box

Spread some paper on the bench and clamp a straightedge to the bench. Register the box sides against the straightedge and tape them together. The tape should stretch tightly and cover the whole joint. Fold over the ends to make it easier to remove later. Turn over the assembly and spread glue in the miters, grooves, and rabbets. Put the top and bottom in place, fold the sides around it, and tape the last joint. I use liquid hide glue for its longer open time. When the glue is dry, remove the tape and any squeeze-out.

## MAKE THE SHARPENING SURFACE

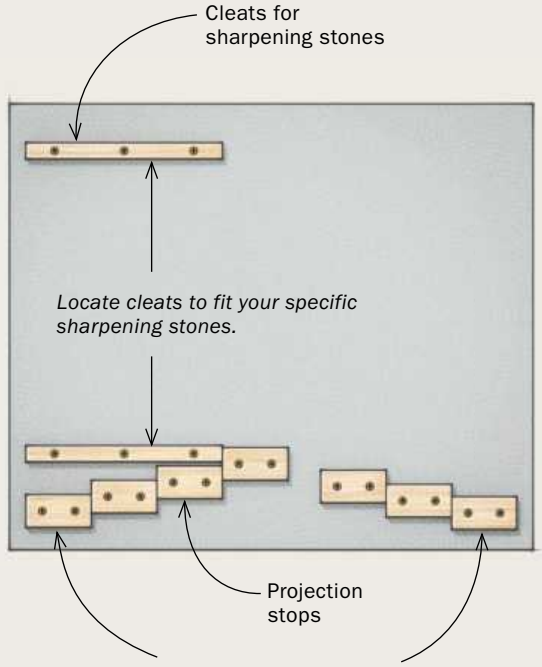
***Lay down laminate.*** *Use contact cement and two dowels under the laminate sheet to prevent premature adhesion while you center the sheet. Once it's centered and overhanging all four edges, press the center down to lock it in and then pull the dowels out.*

***Roll it out to make it stick.*** *Use a rubber J-roller to firmly seat the laminate.*

***Trim the laminate.*** *Rout the overhanging laminate with a bearing-guided, flush-trimming bit in a laminate trimmer.*

### Add the stops and cleats

***Screw down the projection stops.*** *Used to set a honing guide at various sharpening angles, the stops are pre-drilled, and screwed in place. To keep them from shifting while being clamped and screwed, Van Dyke applies a dab of hot glue to the underside of each piece first.*




*Van Dyke uses two different honing guides and mounts a set of projection stops for each.*

## DIVIDE THE INTERIOR

***Start with a mitered liner.*** *The liner goes in first and is held in place with a friction fit. This way, any changes in tooling later on can be made without hassle.*

***Cut V-grooves at the divider locations.*** *After you mark the liner pieces for the locations of the inner dividers, cut the V-grooves in each piece at the tablesaw. A box-joint blade tilted to 45° makes exceptional V-grooves, but a V-groove bit in the router table is a good alternative.*

Set up a bearing-guided, flush-cutting bit on the router table and trim the edges of the sides flush to the plywood top and bottom. Cut spline grooves into the corners at the tablesaw with a flat-top rip blade, avoiding the area where the top will be cut off. Glue in the splines and flush them with a bench plane.

### Free the lid and lay out the work surface

To separate the lid, raise the blade a little over ½ in. and locate the fence so that you will cut a little more off the bottom groove than the top to ensure that the top closes completely. Check the setting of the tablesaw fence using one of the scrap cutoffs you saved when mitering the sides. The lip on the bottom half will probably need adjusting with a shoulder plane to make the top fit well.

The lid of this box is a complete work surface for sharpening. Glue a cleat to its front edge to act as a bench hook. Self-adhesive sandpaper on the underside of the lid helps keep it from sliding around. Plastic laminate glued on both faces with contact cement protects it from moisture and keeps it flat. You can buy small pieces from home centers but try to get "horizontal grade," which is thicker and easier to work with.

Screw the stone cleats and the projection stops for the honing guides to the lid, leaving space for a diamond lapping plate and/or a leather strop.

### Now finish the interior

The liner is a simple mitered frame, pressure-fitted into the box. After fitting the outer frame, mill the divider stock to size. The dividers can be fitted with a simple dado, but I prefer a bird's-mouth joint cut at the tablesaw with a box-joint blade tilted to 45°. I cut the pointed ends of the dividers with a 45° chamfer bit buried in the router-table fence. It helps to make enough extra divider stock so you can dial in the exact size you need. After the grid is made, surface the parts and chamfer the top edges.

Building this box was a simple project and using the box for the past few years has made my sharpening easier and faster.

*Bob Van Dyke is director of the Connecticut Valley School of Woodworking.*

***Points at the ends.*** *To fit the inner dividers into the liner's V-grooves, rout the tip of each to a matching 45° angle. With a V-groove bit buried in the fence, dial in the fit by adjusting the height of the bit until it matches the V-grooves.*

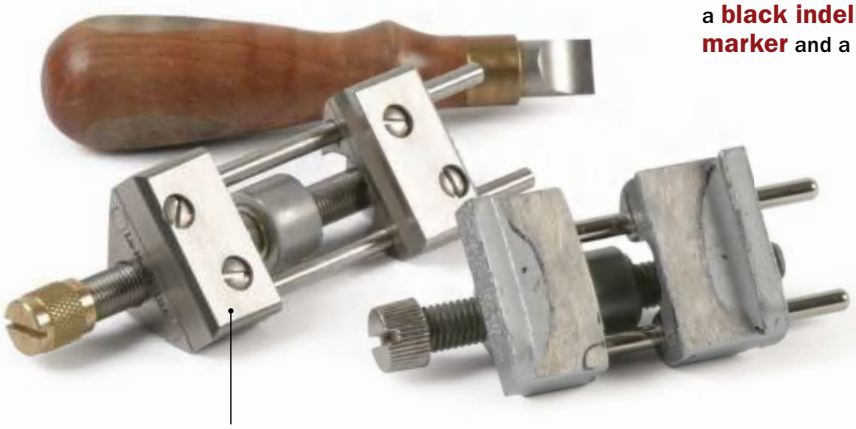
## The gear that goes in the box

**Here is the basic sharpening kit that Van Dyke recommends to his students. The box is designed to hold all of these items. Obviously, if you have a different set of sharpening tools, you should design the inside accordingly.**

***Before you hone.*** *Use a small square to check that the blade edge is square. If it's not, mark the edge with a felt-tipped marker and scribe and regrind the bevel to that line.*

A **small square** and a **wooden straightedge** are used to check if a blade's edge is straight. The wood is safer than steel for checking freshly honed edges.

To mark a chisel or blade for resetting a primary bevel, use a **black indelible marker** and a **scribe**.



Van Dyke uses a **side-clamping honing guide** for plane irons and most chisels. You only need one, but two options are the Eclipse-style honing guide and the Lie-Nielsen honing guide.

***Different guides for different tools.*** *Van Dyke uses the Eclipse-style gauge for plane irons and the Veritas Side-Clamping guide for chisels that the Eclipse style can't hold.*

He uses the **Veritas Mk.II Narrow-Blade honing guide** for narrow and odd-sized chisels that the other gauge can't handle.

Photos, this page and opposite: staff

Van Dyke says **Shapton ceramic stones** cut quickly, give a superb edge, require less flattening, and—unlike Japanese waterstones—do not need to be saturated with water. Just a flushing with the **water sprayer** is enough.

Van Dyke uses a **DMT lapping plate** to flatten sharpening stones quickly.

For the final polish on an edge or back, use a **leather strop** charged with **honing compound**.

Be sure to reserve space for a **file and burnisher** so you can sharpen scrapers.

***Two stones to start.*** *Van Dyke uses two grits of Shapton ceramic stones, 1,000 and 8,000, to set the secondary bevel.*

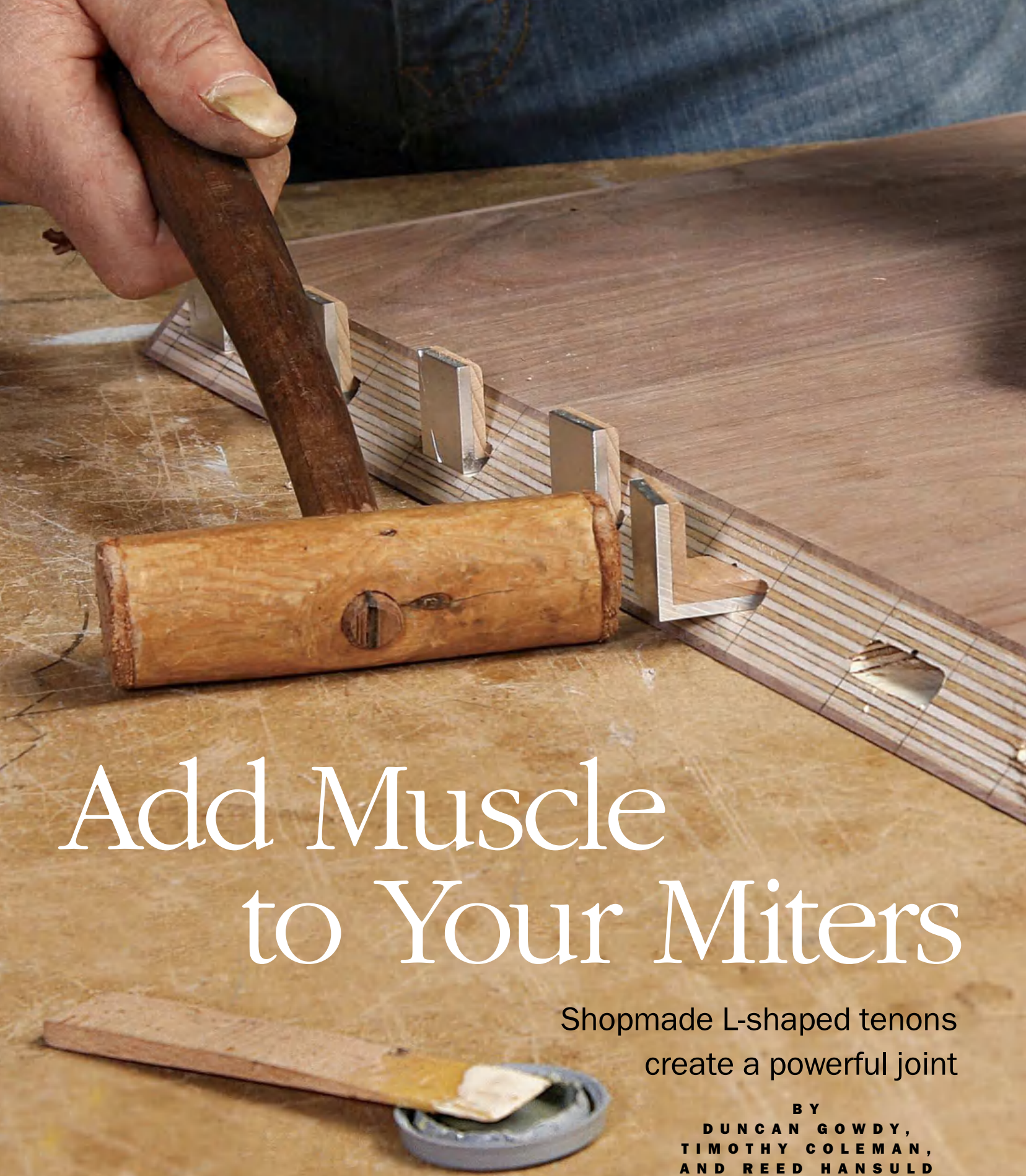
***Flatten them out.*** *The diamond plate excels at keeping stones and tools flat.*

***Strop finishes the job.*** *After running through both stones, a strop charged with honing compound provides the final polish.*

***Don't forget card scrapers.*** *A burnisher and file take care of card-scraper sharpening, a must for difficult grain and efficient cleanup.*

## Article **Extra**

Watch the author's step-by-step method for getting sharp fast.



# Add Muscle to Your Miters

## Shopmade L-shaped tenons create a powerful joint

BY DUNCAN GOWDY, TIMOTHY COLEMAN, AND REED HANSULD



Photos, except where noted: Jonathan Binzen

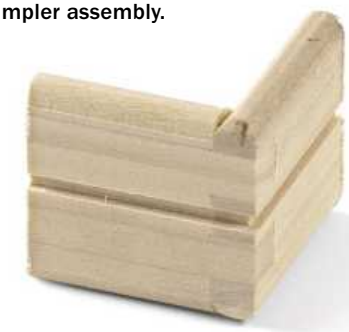
For those who like their joinery subtle and seamless, the miter is indispensable. It allows long grain to flow around a door frame, over the edge of a case piece, or from leg to rail in a chair, unbroken by end grain. And it lets you join sheet goods without exposing the inner layers.

But the miter's glue surface—especially in solid wood—is mediocre, and the space for reinforcement, whether with biscuits, slip tenons, or splines, is limited and also compromised in terms of glue surface. For some years now, we've been seeing a clever solution used by a number of craftsmen: L-tenons, shopmade right-angle slip tenons that allow you to sink a long leg with plenty of face-grain glue surface into each member of a miter joint. L-tenons can be used with almost any sort of miter and on any scale.

We've brought together three fine makers who use the joint frequently, each taking a different approach but all ending up with what one calls "an indestructible miter joint."

## Three versions of the L-tenon

**Reinforcing miter joints with L-shaped tenons makes a beautiful joint suddenly much stronger. The tenons' 90° turn produces a joint with much more available glue surface, all of it face-grain. It also can make for simpler assembly.**

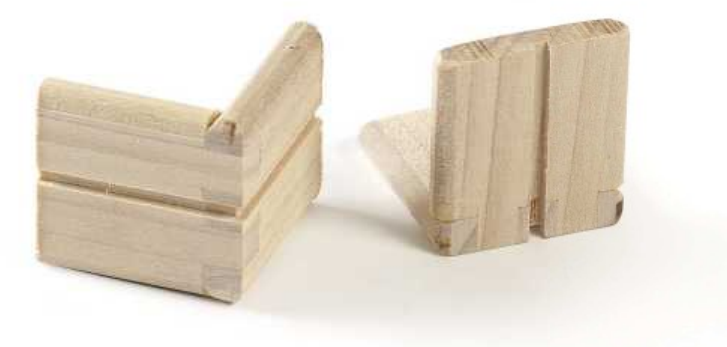


FINGER-JOINTED IN SOLID WOOD

LAMINATED WOOD AND ALUMINUM

PLYWOOD

# Finger-jointed L-tenons



**Solid-wood cases with mitered corners are at the heart of my furniture making. Most of my pieces involve carving, and in pursuit of good surfaces to carve, I build wall cabinets, freestanding case pieces, and small boxes, most of them mitered. And on all of those miters I use L-tenons made by finger-jointing two pieces of solid wood. Yes, I spend a fair amount of time making the tenons, but the resulting strength of the joint is well worth it. Using this technique, I've made L-tenons in sizes ranging from 3 in. across for large case pieces to barely ¾ in. for small boxes. The L-tenon miter joint allows for more straightforward assembly than typical splined miter joints, which must be assembled on the diagonal, often causing a bit of juggling in the glue-up.**

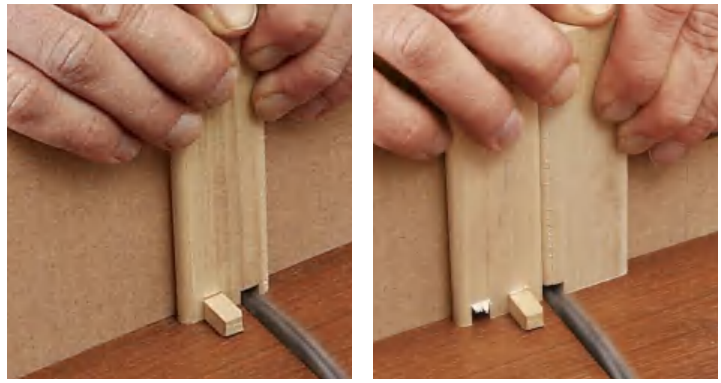
**Duncan Gowdy**
Holden, Mass.

***Flowing frame.*** *With the powerful tenons hidden, Gowdy's mitered case works as a clean, elegant border for his carved doors.*

## MAKE THE TENONS

***Cut the joint.*** *Gowdy cuts the mortises first with a horizontal mortiser, then uses a sled to cut the miters on a tablesaw.*

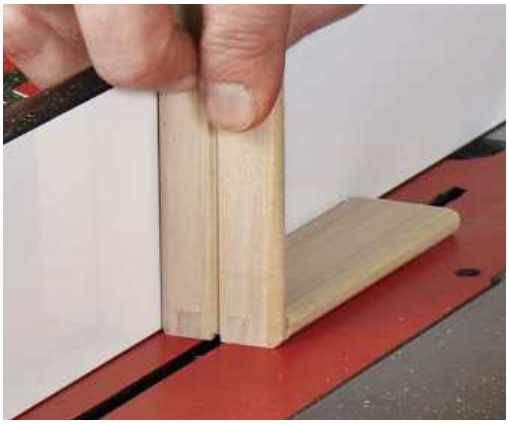
***Fit the strip.*** *After making long blanks and rounding their edges with a bullnose bit on the router table, Gowdy fits them to the mortise.*



***Finger-joint jig.*** *Gowdy uses a dado blade and a dedicated tablesaw jig to cut the fingers. He cuts fingers on the first leg of a pair (left), then uses it as a spacer to make the first pass on the second leg (right).*

***Perfect 90.*** *During glue-up, a drafting triangle held against the inside of the legs creates a reliable right angle. Once the glue has dried, Gowdy trims the proud fingers flush on the router table.*

## FINE-TUNE THEM



***Glue slot.*** *One careful pass over a tablesaw blade raised 1/16 in. produces an escape route for glue.*

***Off with the excess.*** *A low fence at the bandsaw simplifies trimming the legs of the tenons to final length.*

***Quick chamfer.*** *Break the edges with a few strokes of a sanding block.*

## ASSEMBLE THE JOINT

***Glue and drive.*** *With the opposite end of the case dry-fitted and clamped, Gowdy glues the tenons (above) and hammers the joint home (below). He achieves final tightness with quick-release clamps on the angled glue blocks.*

Photo, opposite page (bottom left): Dean Powell

# Wood-and-aluminum L-tenons

Miters reinforced with L-tenons are very useful in casework and furniture, and I've experimented with several methods to create the tenons. I tried using solid wood, either finger-jointed or dovetailed, and I tried plywood. Then I discovered that by gluing strips of wood to aluminum angle stock I could make strong L-tenons quickly.

**Timothy Coleman**
Shelburne, Mass.

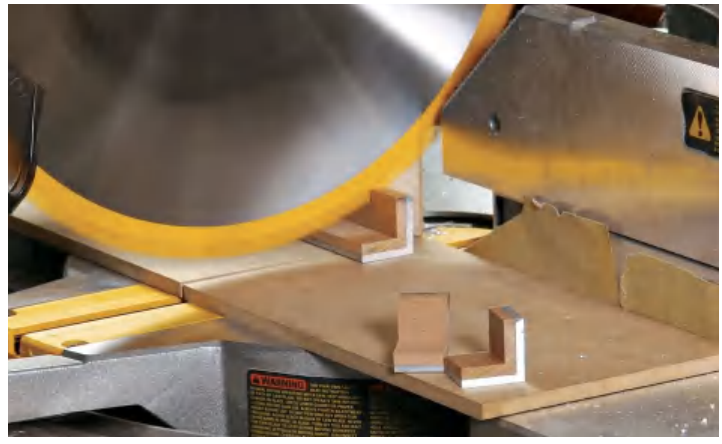
I buy the aluminum angle at the hardware store in 3-ft.-long pieces that measure 1 in. on each side and ⅛ in. thick. It is accurately machined and extremely strong. By laminating strips of wood to the inside of the angle with polyurethane glue, I produce the blanks from which I cut individual tenons. The wood strip allows me to trim the thickness to match the mortise or slot in the miter. I use either the chopsaw or tablesaw to cut the tenons to width. For final assembly of the joint I typically use Titebond. I figure that the tenon will have wood-to-wood glue surfaces on one side, and the faces of the miter offer plenty of additional glue surface. For extra insurance, you could do the final glue-up with epoxy or polyurethane glue.

***Strong and seamless.*** *Coleman's veneered sideboard has mitered corners stocked with L-tenons.*

## MAKE THE TENONS

***Cut the joint.*** *Coleman cuts his miters first, then cuts the mortises with a horizontal mortiser. A router or Domino would work as well.*

***Clamp the sandwich.*** *With the aluminum angle resting in a cradle and the wood strips glued, Coleman uses a square-section caul to distribute clamping pressure. The caul and the cradle are both waxed to resist glue.*



***Chop chop.*** *A regular woodworking blade in the chopsaw (or tablesaw) makes quick work of cutting the long blank into dozens of tenons.*



Photo, bottom left: Timothy Coleman

## FINE-TUNE THEM

***Tenon trimming.*** *Coleman trims the tenon to exact thickness by shaving the wood face on the bandsaw.*

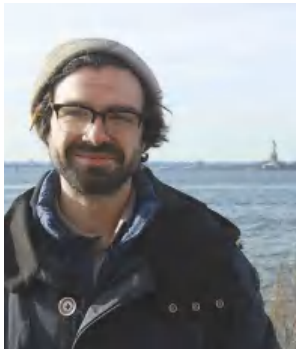
***Chamfer if you must.*** *A few strokes with a file ease the edges of the tenons. To avoid having to round over the side edges of the tenon, Coleman makes the mortises extra wide.*

## ASSEMBLE THE JOINT

***Two-step glue-up.*** *Coleman glues his tenons into one side of the case and lets them dry, then glues them into the second side. This means that to close the joint he needs clamping pressure in only one direction.*

# Plywood L-tenons

I learned the L-shaped plywood tenon from David Upfill-Brown when he was teaching at the Center for Furniture Craftsmanship in Maine. He referred to it as "the indestructible miter joint." I haven't taken a sledgehammer to one of these joints, but since the technique utilizes deep tenons with face-grain glue surfaces combined with the stability and strength of plywood, David may well be right. I find these joints great for mitered casework both in solid wood and sheet goods, as well as for mitered frames and furniture. They can also be used where parts meet at angles other than 90°, and even for compound angles.



**Reed Hansuld**
Brooklyn, N.Y.

I make the tenons from Baltic-birch plywood, which is free of voids, and I cut the mortises with a Domino or a router. I produce the tenons by gluing up a long blank of plywood blocks and then slicing it up like a loaf of bread, which makes it easy to produce lots of identical tenons.

***Frame job.*** *Hansuld's coffee table has 19 mitered frames, each one reinforced with plywood L-tenons.*

## MAKE THE TENONS

***Miters after mortises.*** *After using a Domino to cut the mortises on his frame members, Hansuld cuts the miters with a chopsaw.*

***Glue up a stacked blank.*** *When gluing up the stack of Baltic-birch squares, be sure the grain direction on the face alternates in adjacent blocks. Hansuld marks each block to show grain direction. He uses cauls along all four sides of the stack to maintain alignment during the glue-up.*

***Rip to make a notch.*** *First saw all four edges to create a clean, square blank. Then make two ripcuts with the blade at about half height to yield the L-shaped blank.*

***Slice off the tenons.*** *Hansuld uses the miter gauge, with a stop block clamped to the fence to control thickness.*

## FINE-TUNE THEM

***Notch the elbow.*** *A side-to-side scrape at the bandsaw cuts a shallow notch that prevents the tenon from catching on the edge of the mortise during assembly.*

***Rout a radius on the edges.*** *Working carefully and using a push block, Hansuld rounds over the edges of the tenon on the router table.*

***Final fit.*** *To tweak the final fit, Hansuld rubs the tenons on 100-grit sandpaper adhered to plywood.*

## ASSEMBLE THE FRAME

***Four-way glue-up.*** *Hansuld glues all four joints at once, then applies pressure with quick-release clamps along the length and across the width of the frame.*

### When the miters aren't square

Hansuld's bar stool is made with a series of mitered frames, none of them meeting at 90°. He made plywood tenons to reinforce all of them.

***Bandsaw the notch.*** *After gluing up a long blank and then cutting it to shape on the tablesaw, Hansuld creates the notch at the bandsaw.*

***Steady slicer.*** *Using the notch cutoff as a push block, Hansuld slices the block into wide-angled tenons.*

***Screwy glue-up.*** *With no easy purchase for clamps, Hansuld glues on angled clamping blocks. For compound angled joints, you can use wider mortises to allow some adjustment.*

Photos, opposite page (bottom left), this page (top right): Reed Hansuld

# Super Glue

Photos, except where noted: Anissa Kapsales

# to the Rescue

BY MARK SCHOFIELD

We've all been there. You chip a plate in the kitchen or break off a vital section of wood you are working on. If you want an invisible repair, the area is hard to clamp, or you don't want to wait for the glue to set, the answer is Super Glue.

Speed is the main advantage of Super Glue, whose technical name is cyanoacrylate (CA) glue. A repair or a joint made with CA glue can be shaped, sanded, or finished within about five minutes. Another advantage is that CA glue doesn't add moisture to the wood, so there is no problem with wood swelling. If you sand a joint too soon after it was made with a polyvinyl acetate (PVA) glue, you can end up with a depression after the moisture has evaporated and the wood shrinks.

*Fine Woodworking* asked me to take a close look at this special family of glues to find out how woodworkers use it. While researching this article, I picked up great tips for its everyday uses in woodworking. I even tried a relatively new type of CA glue specifically designed for wood that is threatening to make inroads into yellow glue's long dominance. It's time woodworkers gave CA glue a second look.

## A unique glue

CA glue is an acrylic resin that does not dry, but rather reacts or polymerizes in the presence of water, either in the form of vapor in the air or moisture in the wood. Unfortunately it is this reaction with moisture that causes CA glue to have such a short shelf life; the moisture in a half-used container will cause the remaining glue to harden. CA glue will not work properly on a highly acidic surface such as tannin-rich oak. In a case like this you need to use an accelerator (also called an initiator), either applying it to one surface and glue to the other, or applying accelerator around the joint after the two parts are joined. An accelerator is also handy for repairs, eliminating the need for clamps.

Be extra careful when handling CA glues. Read the directions about what to do if you get

From repairs to assembly to finishing, how to get the most from this versatile shop helper

### Many brands and types

**Cyanoacrylate glues are available in a variety of sizes, brands, and viscosities for different tasks, as well as accelerators to hasten curing. Thin CA glue's low viscosity can go places other glues can't, such as hairline cracks. Medium-thickness CA glues are better for bigger repairs or even as a finish. And the thickest types can be used for building entire pieces.**

# Repairs are a breeze

## FILL AND CLAMP CRACKS

***Low viscosity is ideal for hairline cracks.*** *Forcing in a too-tight tenon can crack the wood around the mortise.*

***Open wide.*** *Use a flat screwdriver or other narrow blade to torque open the crack so that glue flows down into it.*

***Clamp and wait.*** *Just a few minutes of pressure and the part is ready to go.*

## REPLACE SMALL CHIPS IN A JIFFY

***No clamps needed.*** *With the addition of an accelerator, CA glue is great for repairing chipped surfaces. Apply the glue and hold the chip in place (right). While applying pressure to the repair, liberally spray accelerator to speed up curing time (below).*

some in your eye or if you glue your skin together. In the latter case, some glue manufacturers tell you to apply acetone, others to hold the skin under water, but in either case gently rub the bonded area back and forth until the glue dissolves. Don't try to pull the "joint" apart, because you risk tearing the skin.

While most generic CA glues have a low viscosity, meaning they are thin and runny, you can also buy medium and thick varieties designed specifically for woodworking.

### A different kind of CA glue

Nexabond, a CA glue designed for woodworking, was introduced a few years ago. Instead of using moisture alone as a catalyst, Nexabond uses sodium and potassium salts found in all kinds of wood. So its performance does not depend on wood's moisture or environmental conditions. Contributing editor Michael Fortune ("Instant glue creates strong bond," *FWW* #241, p. 21) said it works even when his shop is cold and dry in winter.

Nexabond is thicker than most CA glues—indeed thicker than some PVA glues—and it contains additives to reduce the brittleness found in other CA glues. Because it is solvent-free, 100% of the glue stays in the joint, so less is needed than other types of glue. That's good news because it is pricey: 1 oz. of Nexabond costs around $8, 4 oz. is $17 to $23 (it varies by open time). Unlike PVA glue that has to be forced into the wood, clamping pressure for Nexabond is less important.

The glue comes in three variations based on open time: the short type is 1 to 3 minutes (fine for gluing a single joint), the medium is 3 to 5 minutes (better if you are applying a long strip of molding), and the long is 5 to 10 minutes (best for a complex assembly).

### Make fast, strong repairs

CA glues with a low viscosity easily flow into hairline cracks and checks to produce an invisible repair.

Torn-out chips can be fixed quickly. For small repairs, use low-viscosity CA glue with an accelerator. For bigger repairs, say if a piece of a carving breaks off, use medium CA

## REPLACE BIG CHUNKS WITHOUT CLAMPS

***A carver's friend.*** *If you accidently break off a chunk while carving a detailed piece, medium CA glue is your savior. Apply a generous amount, fit the piece, and hold it down.*

***Hasten curing time.*** *Spray on accelerator and return to carving again in five minutes.*

## FILL VOIDS IN A FLASH

***Pack it, glue it, and spray.*** *Fill the void with wood dust, add glue, and then spray on accelerator. Repeat until the filler is flush or proud of the surface.*

glue with an accelerator. The accelerator eliminates the need for clamps—a lifesaver for an intricate piece—and gets you back to work faster.

### Use it as a clamp

Woodworking instructor Bob Van Dyke uses CA glue as a clamp while making jigs as well as to reinforce the edges of MDF templates in those jigs.

Medium CA glue also can be used as a kind of clamp in conjunction with PVA glue. For example, instead of struggling to clamp the odd shapes and angles on a piece of crown molding, you can instead apply sections of CA glue in between longer stretches of PVA glue. Hold the molding in place for a minute until the CA glue sets, and the CA glue will then act as a clamp until the slower drying but stronger PVA glue sets.

Because of CA glue's low shear strength, one of the first uses for the glue was as a thread locker, which stops nuts from vibrating off bolts but still allows them to be removed if the force of a wrench is applied. In the same vein, turners sometimes use thick CA glue to temporarily attach a small blank or partly completed turning to a wooden

***Sand it flush.*** *CA filler dries more quickly than oil-based fillers. And unlike water-based fillers, it won't shrink as it dries, so you end up with a repair that can be leveled with a sanding block.*

# It works as a clamp

## PAIR WITH PVA GLUE

***Help hold odd shapes.*** *Apply sections of CA glue in between longer stretches of PVA glue. Hold the molding in place for a minute until the CA glue sets. It will then act as a clamp until the slower-drying but stronger PVA glue sets.*

## SECURE BEFORE SCREWING

***Mark your place.*** *To keep parts like the alignment blocks on this jig from shifting while screwing, apply a thin bead of glue around the edges first (left). Use accelerator to lock it in place (center), and finish up with screws (right). The block is more than secure enough to screw it in place from the bottom.*

## TEMPORARY HOLDING POWER

***Glue it on.*** *Use thick CA glue to attach a small blank or partly completed turning to a wooden glue block. Apply glue to the block and accelerator to the turning before holding them together.*

glue block, usually applying glue to the block and accelerator to the turning. You should use this only for blanks that won't be subject to extreme force when being turned. To remove the block, you just cut into it on the glueline and pop off the bowl.

### Fortify vulnerable areas

CA glue is also useful for stabilizing and reinforcing areas of spalted wood, whether they are being turned, planed, or sanded. Similarly, it can be used to stiffen wood fibers prior to the insertion of threaded inserts.

# It also adds strength

Furniture maker Will Neptune uses CA glue to harden and preserve the edges of matboard templates and to reinforce screw holes.

## A fast-drying, stable filler for cracks and voids

When you are inlaying, a high-gloss finish can highlight any slight gaps between the inlay and the surface of the substrate. Trying to fill them with finish is a slow process. CA glue is fast, and you can sand away any that is proud.

Thick CA glue is great for gluing loose knots and, when mixed with sawdust, excels at filling small voids. This CA filler dries more quickly than oil-based ones and unlike water-based fillers, it won't shrink as it dries.

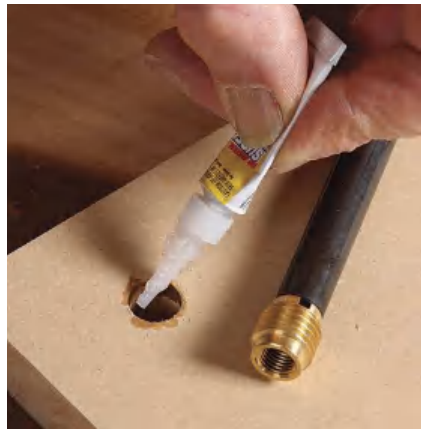
## A super finish

Any brand of CA glue that comes in a medium consistency can be used as an acrylic finish by pen turners. Apply it in multiple thin coats while the blank is turning, and then sand and polish to leave a very durable, high-gloss finish.

## Building with CA glue

A big question for me as I began my research was whether CA glue can be used to assemble furniture. To verify, I first made a few trial mortise-and-tenon joints to make sure the glue was slippery enough to allow the tight-fitting joint to be driven all the way home before it seized up. I also did a low-tech strength test (see p. 66).

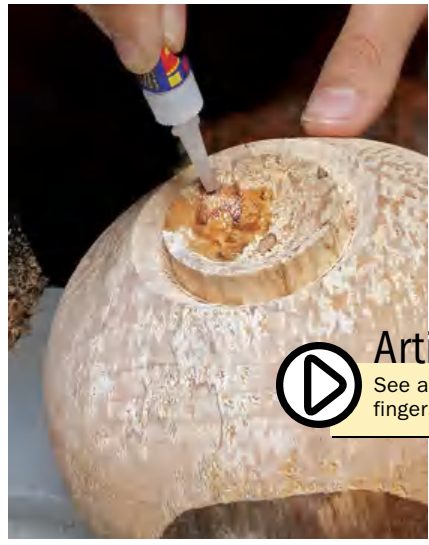
Then I built a small wall cabinet. I used the medium version for the four mortise-and-tenons on the door, the long version for the cabinet box, but the short version for individual joints such as the base



***Lock in a threaded insert.*** *Line the hole with CA glue and install the insert.*

***Reinforce screw holes.*** *Neptune uses CA glue in softer woods where he has to insert shallow screws, such as for hinges.*

***Harden edges of templates.*** *Will Neptune uses mat board to make templates for chair back splats, cabriole legs, etc. He lets thin CA glue soak into the edges and after it dries "as hard as laminate," he can refine the profile by filing or sanding.*



***Fortify soft areas.*** *Spalted wood that has been softened by fungi can be hardened with CA glue.*

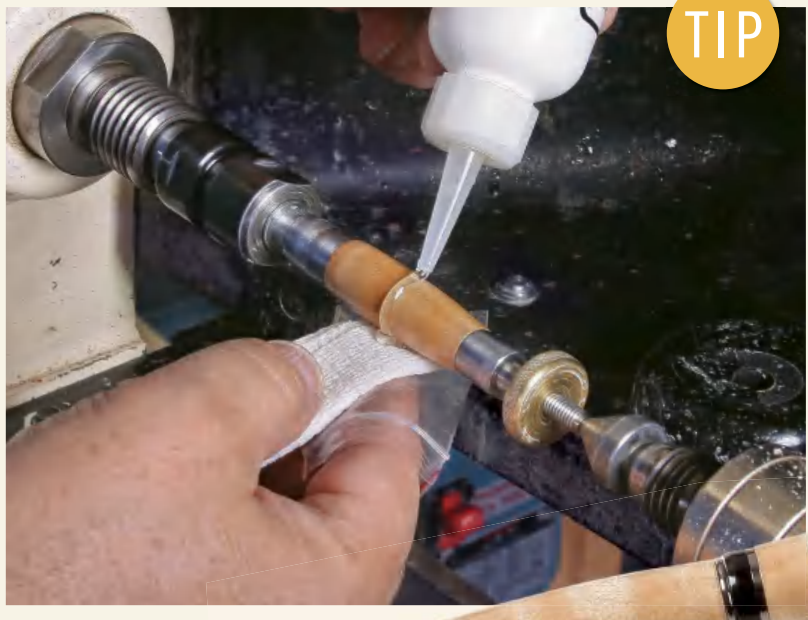
**Article Extra**

See an easy way to get fingers unstuck.

TIP

### WORKS AS A FINISH, TOO

Apply medium CA glue to a turning blank as you spread it with a paper towel. Wear a disposable glove or wrap your finger in a plastic bag. Spray on accelerator to cure the finish instantly.



Photos, opposite page (top two): John Tetreault

***The Nexabond connection.*** *Schofield built a small cabinet to test Nexabond as a furniture glue. During assembly, he didn't change much to accommodate the new glue. He discovered that CA glues don't require as much clamping force as PVAs, and take a much shorter time to set, but they don't fill gaps.*

## Is it strong enough for the job?

**Schofield made three joints to test each glue, measuring the glue strength using a bench vise. Thin CA glue broke after ¼ turn of the vise handle, the medium version of Nexabond lasted ½ turn, but the PVA glue and the Titebond Instant Bond each lasted about ⅝ turn. While the thin CA glue joints broke entirely along the glueline, the other joints broke due to a mixture of glue and wood failure; in other words, the PVA glue and the two thicker CA glues were all stronger than the wood.**

molding. The only joint failure I had was an unreinforced miter joint on the base molding. I sanded away the glue residue, added a partial spline, and had no more trouble.

### Extend the life of your glue

An unopened container of regular CA glue should be viable for about a year at around 70°F, but if you store it in the refrigerator you can probably double that time, and in the freezer it will keep almost indefinitely. Just don't let the glue freeze, which it does at -8°F (most home freezers operate at around 0°F). Nexabond has a shelf life of 12 months from the date of manufacture at 72°F and at least 18 months if kept in a refrigerator, whether or not it has been opened. Do not store Nexabond in the freezer as it shouldn't be allowed to go below 32°F.

Once the glue has been opened, hot and humid storage will cause it to harden in a month or two, whereas in cool, dry conditions it should be good for at least six months. You can try storing glue in a sealed container with a bag of silica gel (the kind that often gets shipped with electronic goods). If you use a container of regular CA glue straight from the freezer, be sure to let it warm up to match the temperature of the workpiece.

To prevent the narrow dispensing tube from getting blocked, always clear it after use by holding the container upright and tapping it on the work surface before screwing on the cap. Some suppliers sell extra tubes, or you can soak a blocked tube in acetone. □

*Mark Schofield is a former FWW managing editor who lives in Southbury, Conn.*

# Make Your Own Scratch Stocks

## These tiny tools will have a big impact on your furniture

BY GARRETT HACK

Every so often you discover a hand tool that changes your woodworking. Scratch stocks have changed mine. These versatile tools have not only greatly expanded my ability to create fine details, but they've also changed my design aesthetic, allowing me to play with edges to create custom profiles that fit perfectly with my work. And the design possibilities are almost limitless.

I use a shopmade scratch stock. It's really just a small metal scraper sharpened to carve a detail into an edge and held in a block of hardwood. You can make any shape you want way beyond what any stock router bit can achieve. I use them to cut finely molded details like delicate beads as well as perfectly excavated inlay grooves. Well-sharpened, a scratch stock will cut cleanly in any wood, even in the most ornery or figured species.

Here I'll show you how to make a simple scratch stock, and give you some tips on using one. This size

# A scratch stock, from scratch

## 1. SHAPE THE SCRAPER

***Snip.*** *Cut out the scraper blank from a piece of spring temper steel. Hack takes it from an old handsaw blade. The size will vary based on the profile you're trying to achieve, but for a simple bead a blank 1 in. by 1¼ in. is good.*

***Smooth.*** *Use a flat mill file to square up the edges. Hack holds the scraper in a small machinist vise but lacking that, you can use a bench vise.*

***Shape.*** *A bead profile is a great starting point for getting into scratch stocks. To create the profile Hack uses a round chainsaw file.*

## 2. GET IT SHARP

***Faces first, then the edge.*** *Hone both faces of the scraper (far right), working through the grits from coarse to fine. You only have to polish the area immediately around the cutting profile. Finally, hone the edge of the scraper to a nice polish (right).*

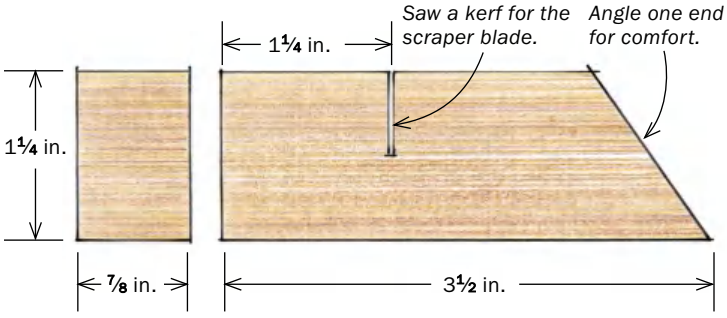
***Get inside.*** *To hone the concave area of the scraper, Hack uses a slip stone (above). You can substitute a rounded stick or dowel and fine sandpaper (right) to do the same job.*



Photos: Thomas McKenna

## 3. ADD A HOLDER

***Cut a kerf.*** *Size the holder to fit your grip—⅞ in. thick by 1¼ in. wide by 3½ in. long is a good starting point. Smooth its surfaces and chamfer the edges, then cut a kerf for the scraper.*




works for many applications. It will cut as far as 1 in. from the edge. For cuts farther in, you'll need a larger blade and/or holder.

### Create the profile

The best steel to use is the kind found in an old handsaw or card scraper, known as "spring temper" steel. It's soft enough to take a profile easily yet durable enough to hold an edge in almost any wood.

I start by cutting a blank that's roughly 1 in. by 1¼ in. Use a flat file to square up any edges of the blank that you'll use. Once that's done, it's time to create the profile, in this case a simple bead. I work by eye, but for your first time you may want to draw it out on the blank. Your call. A blank can have four different profiles, if you'd like—one on each corner. Then you simply rotate the scraper in the holder to the profile you want to use.

Holding a round file horizontally and just in from the corner of the blank, cut until it is about half buried in the edge. The shape can be round or oval. The goal is to leave a small tooth on the corner. That tooth cuts the groove, or quirk, that defines the bead. A fine tooth works best. Once the profile is created, it's time to sharpen.

### Hone the edges

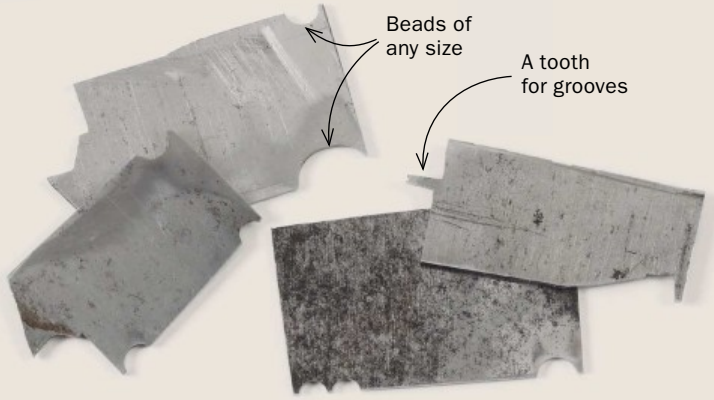
Each profile has two cutting edges, which means you can cut both forward and backward. And that's part of the reason a scratch

***Install the scraper.*** *Tap in the scraper until it bottoms out in the kerf (above). Then adjust its projection (left) from the block to locate the bead (or other profile) perfectly on the work. Test it on scrap until you have the location nailed.*

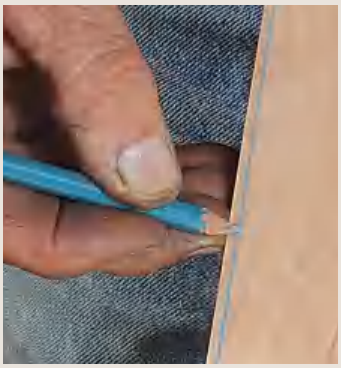
***Cure for a fat kerf.*** *If the scraper is loose in the kerf, drill and install a screw or bolt to wedge it in place.*

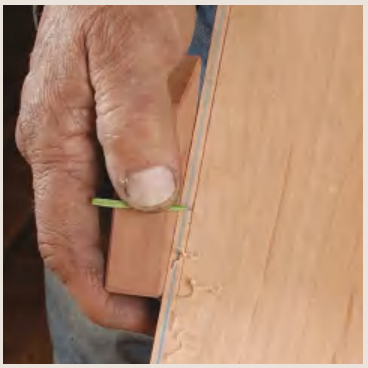
## How it works

**There's really no limit to the profiles you can create with a scratch stock. The two that Hack uses most often are for beading an edge and excavating for string inlay. Regardless of the job, the technique is the same. For best results, use a light touch, and angle the scraper in the direction of the stroke.**

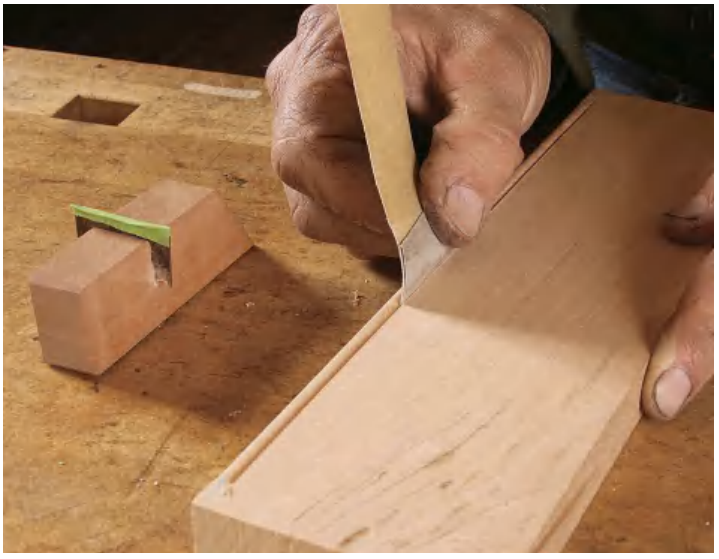



## BEAD WITH A QUIRK





***Colored pencil guides the way.*** *Mark the apex of the bead (or the high point of a different profile) on the edge of the board (above left) and adjust the scraper so that its tooth is just beyond that mark (above right). Cut until the pencil line just disappears. This will create a bead that's parallel to the original surface. Remove any fuzz with fine sandpaper (below).*



stock can cut so cleanly, because you can always cut with the grain no matter how it changes.

Both of those cutting edges must be honed square and polished. Right off the file, a scratch stock cutter will do serviceable work, but honing the edges will make it operate far better. I start with a coarse stone, 600 to 1,000 grit, to remove any file marks and surface corrosion on the steel.

On the faces, you don't have to hone the entire scraper, just the area around the profile. For the bead profile, hone the top of the tooth, the two faces of the scraper, and the outside (and original edge of the corner). For the concave areas of the profile I use slip stones. If you don't have slip stones, shape a piece of hardwood and wrap it with fine sandpaper or smear it with a bit of diamond paste to work the concave areas. Work up through the grits. I often hone an edge to 8,000 grit, but you can stop well short of this. The advantage of honing more is that the edge will be sharper and last far longer.

## APPLIED BEAD

***A standout detail.*** *To make applied cock beading for a drawer, door, or apron, Hack uses the scratch stock to round over the edge of the thin workpiece. Again, he takes light passes in both directions.*

**Article Extra**
Watch Garrett Hack make and use a scratch stock.

## GROOVES FOR STRINGING

***Works as an inlay tool.*** *Hack uses scratch stocks to excavate for string inlay. The scraper is filed with a tooth profile to match the width of the stringing.*

### Make the holder

Once the scraper is ready, make a holder. Generally, ⅞ in. thick by 1¼ in. wide by 3 in. long is a good size, but size the block to fit your grip. I use a hardwood scrap, smoothing the surfaces and breaking the corners with a block plane so it is comfortable to hold.

Saw a kerf at right angles to the length of the stock and cut about halfway through. Use a saw that has a slightly smaller kerf than the steel you use for the scraper. With a hammer, tap the scraper into the holder. Then position the scraper horizontally until it cuts exactly where you want it to. Test the setup on scrap until you're dialed in. The fit should be snug enough that the blade remains fixed in use. If the kerf is too wide for the scraper, put a machine screw into one end of the holder and tighten it against the scraper. Now you're ready to cut.

### Tips for using any scratch stock

I have dozens of scratch stocks with different profiles. Whenever I want a new edge detail, I just make a new scraper or file the profile into an existing scraper. No matter the profile, they all cut the same way. Here are some keys to success.

In general, these are scraping tools, and they don't cut a lot of wood quickly. Let them cut. Light pressure is best. Angle the scratch stock forward when pushing it. Angle it backward when pulling. The harder the wood the better the results you'll get, especially for very fine profiles. Ebony is wonderful; so are maple and rosewood.

I like to cut repeatedly in the same direction for a half dozen strokes, then reverse. One direction always seems to work more smoothly, and that's the direction I typically finish with.

Since these scrape, you'll end up with a surface that's pretty smooth, but I like to finish them with some very fine sanding, 220 to 320 grit.

Give scratch stocks a try. You'll quickly see a big difference in your furniture. □

*Garrett Hack is a contributing editor.*

# Cedar Garden

## Quick-to-make, casual seating designed to beat back the elements

When I was asked to design a bench for a garden at the Chuang Yen Monastery in Carmel, N.Y., my goal was to build something beautiful that would age gracefully outdoors. My first step was to pick a wood that could withstand years in the weather—even without a finish.

My thoughts traveled to the magnificent wooden buildings I had visited in Kamakura, Japan—a historic city brimming with meticulously crafted wooden temples that are hundreds of years old. In Japan, a common wood used for temple and bathhouse construction is hinoki, an indigenous, fragrant variety of cypress that is particularly resistant to decay. It was used to build the Horyu-ji temple outside of Nara, Japan, which is just over 1,300 years old and still in daily use.

Hinoki isn't available in the United States, but an excellent substitute is Port Orford cedar, which is strong, light, exceptionally resistant to decay, and beautiful when left to age in the weather. It's what I used to build the benches for the temple. I left them unfinished, and after one year in the sun, rain, and snow, they're looking great.

As for the design, I was striving for a minimalist but elegant bench that would sit beautifully in the monastery's garden. I settled on a trestle base with thick legs and a single stretcher connecting the two ends. The seat is made of ribs that have a slight curve on their top edge, and beveled ends.

In my shop, my employees and I work together to build furniture. I teamed up with Nic Meehan on this bench, and we'll show you how to make it. It's actually quite easy.

### Gentle arc sheds water

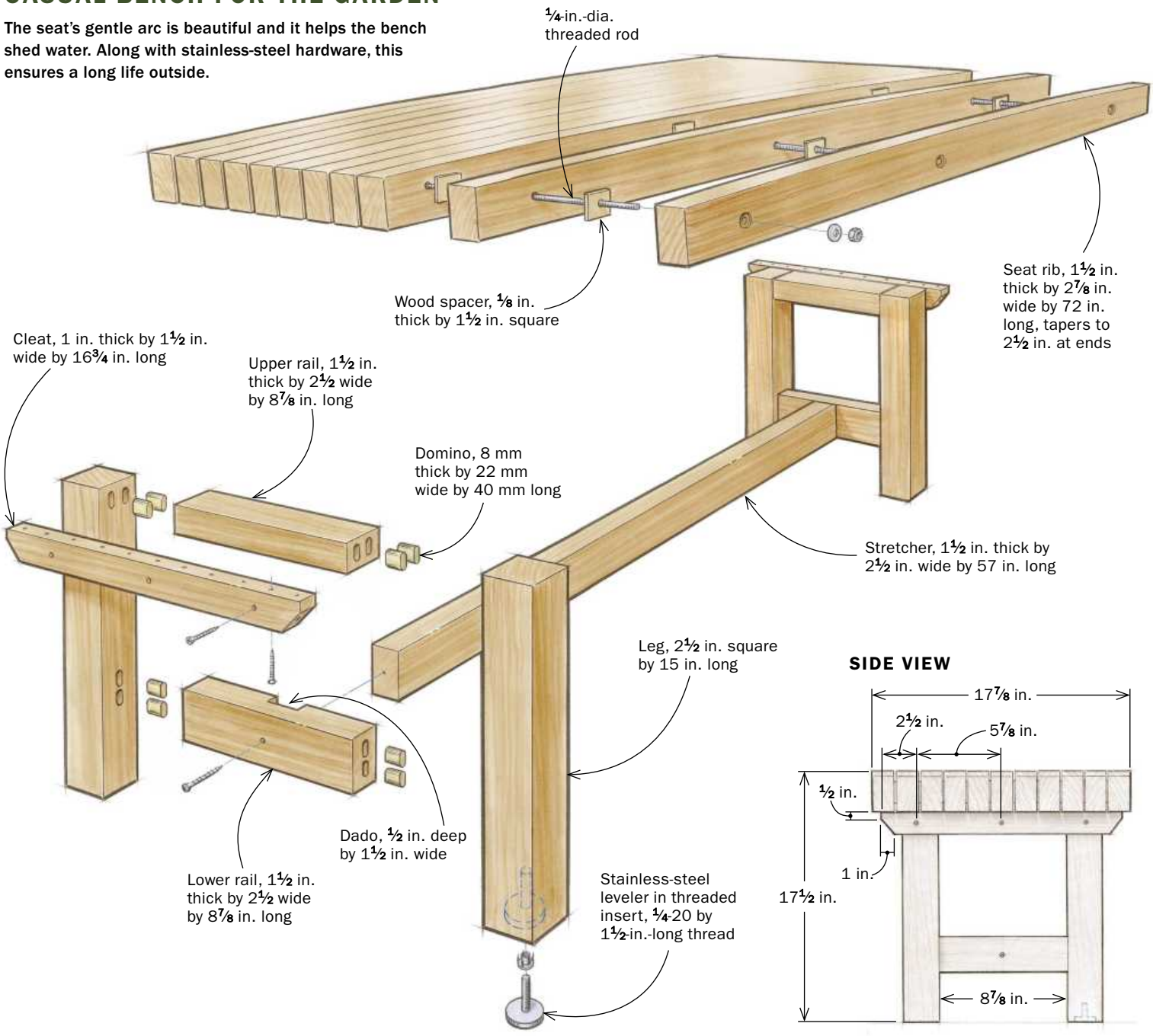
My first goal for the seat was to ensure that it could withstand

# Bench

BY JESSICA WICKHAM

## CASUAL BENCH FOR THE GARDEN

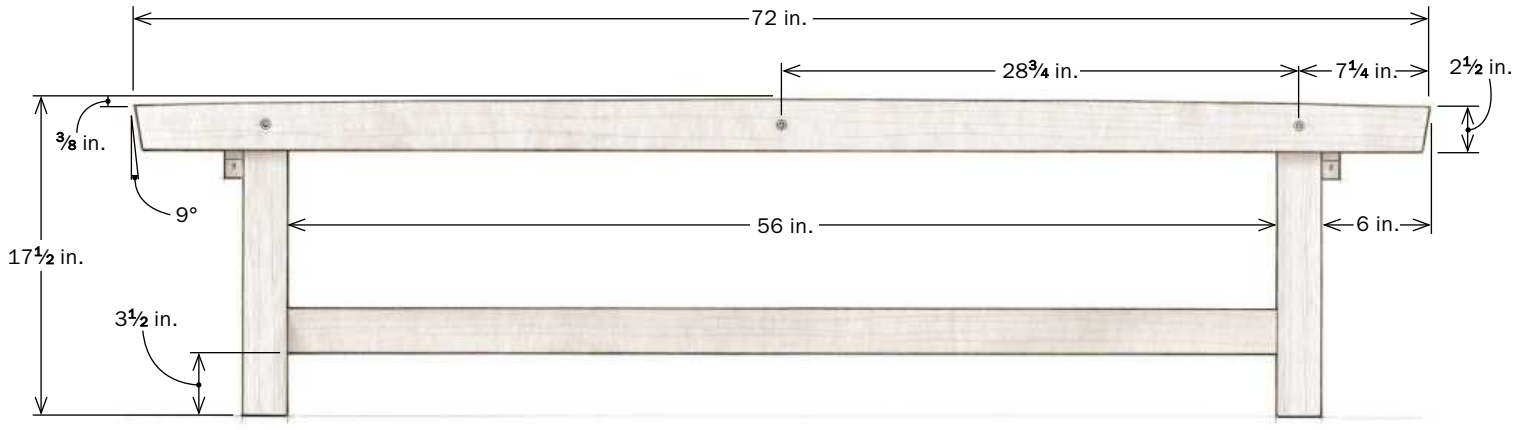
**The seat's gentle arc is beautiful and it helps the bench shed water. Along with stainless-steel hardware, this ensures a long life outside.**


¼-in.-dia. threaded rod
Wood spacer, ⅛ in. thick by 1½ in. square
Seat rib, 1½ in. thick by 2⅞ in. wide by 72 in. long, tapers to 2½ in. at ends
Cleat, 1 in. thick by 1½ in. wide by 16¾ in. long
Upper rail, 1½ in. thick by 2½ wide by 8⅞ in. long
Domino, 8 mm thick by 22 mm wide by 40 mm long
Stretcher, 1½ in. thick by 2½ in. wide by 57 in. long
Leg, 2½ in. square by 15 in. long
Dado, ½ in. deep by 1½ in. wide
Lower rail, 1½ in. thick by 2½ wide by 8⅞ in. long
Stainless-steel leveler in threaded insert, ¼-20 by 1½-in.-long thread

### SIDE VIEW




### FRONT VIEW






Photos: Matt Kenney; drawings: Dan Thornton

## Make and assemble the seat

**Comfort is king when it comes to seating, so it's important that each of the seat's ribs have the same shape. A router template delivers the needed uniformity.**

***Trace the arc on the rib.*** *After making the template routing jig, use it to trace the profile of the rib (left). Rough-cut the arc at the bandsaw, then use the jig to complete the arc (above). Hold-down clamps lock the rib against a fence, and front and back stops add stability.*

***The outside ribs get counterbores.*** *These should be deep enough to contain the thickness of the nut used to lock the ribs on the threaded rod. Next, drill ¼-in.-dia. holes in all of the ribs for the threaded rod.*

the vast changes in weather that it would experience. Temperatures in Carmel run from extremely hot to extremely cold, and there's plenty of rain and snow. This is why I chose to make the seat from a set of 11 ribs shaped in a subtle arc. The arc encourages water to run off the seat toward the ends, where a bevel causes it to drop to the ground (rather than run down the end grain as it would if the ends were square). Spacers between the ribs create openings that help with drainage, too. Three threaded rods run through the ribs and spacers to keep the seat together.

Start the build by making a template routing jig for the seat ribs. Use the template to trace the shape on each rib. Rough out each rib at the bandsaw, then clamp it into the template jig to rout it flush. Because the ribs are 1½ in. thick, you'll need a pattern bit with at least that much cutting length.

Next, drill holes for the threaded rod. We placed the flat bottom edge of the rib against a long fence on the drill press

***Assemble the seat.*** *Make sure to add the spacers between the ribs (above). The threaded rod should be about 1 in. too long at this point. Drop a bit of Loctite on the threaded rod before threading on the nut (left). This will keep the nut in place through all kinds of weather.*

# Build the trestle base

Slip tenons and screws combine to create a base that's sturdy and able to withstand the beating delivered by sun, rain, snow, and anything else the elements might send its way.

***Cut a dado for the long stretcher.*** *Use a stop at both ends of the stretcher to ensure that the dado in each rail is the same width and in the same location.*

***Mortise for the slip tenons.*** *In Wickham's shop, they use a Festool Domino Joiner for the job, but you could use a router or hollow-chisel mortiser.*

***Glue up the end assemblies.*** *Because this bench is for the outdoors, use a waterproof glue. Wickham prefers Titebond III. After assembling the legs and rails, clamp and let the glue dry.*

and used stops to ensure that the holes lined up correctly from one rib to the next. On the two outside ribs, there also need to be counterbores for the nuts. Drill those before drilling the holes for the rod.

Next, make the spacers. I used Port Orford cedar so they'd blend with the seat. Now assemble the seat with the spacers in place, and mark the threaded rods for final length. Pull out the rods and cut them to length with a hacksaw. Reassemble the seat to bevel the ends of the ribs, but to prevent tearout, leave out the spacers. We used a tracksaw, but you could use a standard circular saw and straightedge, too. Pull the seat apart and reassemble it for the last time with the spacers in place.

## Build the base and attach the seat

After milling all of the base parts to final dimensions, flip the legs over and drill two holes. One is a counterbore to accommodate a leveling foot, and the other will hold a threaded insert for the leveler's

***Stretcher completes the base.*** *A single stainless-steel screw at each end is enough to keep the stretcher tight in the dadoes.*

# Attach the base to the seat

**A three-step process creates a strong connection between the seat and base that will last for years.**

threaded stud. We used a shop-made jig to guide the drill bit for each hole.

The legs and rails are joined with slip tenons. We use a Festool Domino system for the joinery because of how quickly and easily it gets the job done. There are many other ways to make a slip-tenon joint, so don't get hung up by our technique. The lower rail needs a dado to house the stretcher that connects the two end assemblies. We cut that with a dado set at the tablesaw.

With the joinery complete, glue up the end assemblies. Because this is an outdoor bench, use a waterproof glue, like Titebond III. After the glue dries, bring the ends together with the stretcher. Put some glue in the dado joint and then drive in a screw from the outside face of the stretcher.

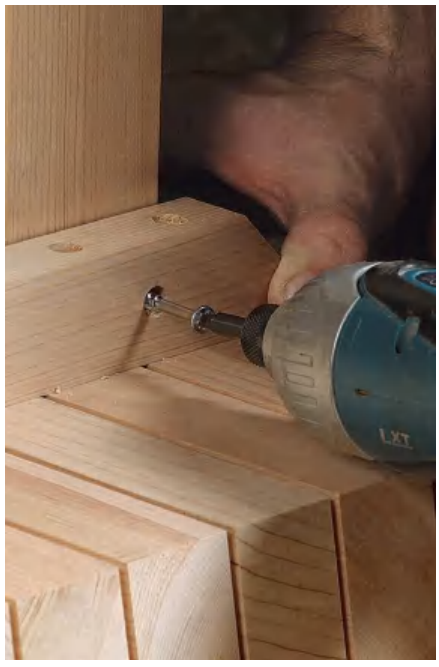
Before attaching the seat to the base, make the cleats that help secure them. Now flip the top and center the base on the underside, measuring in from both ends and sides. Place the cleat on the seat, snug against the base. Secure it to the seat by driving a screw into each seat rib. Next, use two screws to attach the top short stretcher to the seat. Finally, screw the cleat to the base with three screws. Use stainless-steel screws throughout.

That's it for the construction. And there's no finish to apply. Give your bench a good sanding, take it outside, level it, and enjoy it as it ages to a beautiful silver gray. □

*Jessica Wickham, a furniture designer and maker in Beacon, N.Y., owns Wickham Solid Wood Studio.*

***Center the base on the seat.*** *This is easier than lowering the seat onto the base, because you can more easily center the base by measuring in from the edges.*

***Attach the cleat to the top.*** *Drive a stainless-steel screw through the cleat and into each seat rib (left). Screw down the base next. Two screws (one at each end) are all it takes.*



***Join the cleat to the base.*** *Three screws—one into each leg and the third centered between them—complete the joinery.*

# gallery

## WILLIAM GEYER
Montoursville, Pa.

Geyer teamed up with Fred Gilmour, an artist and fellow retiree from the Pennsylvania College of Technology, to make this rocker for an auction at the school. Gilmour designed the chair after seeing original work of Charles Rennie Mackintosh in Scotland. Geyer used Gilmour's sketches to make a prototype from poplar and the final piece from walnut, and designed the table to go with it. "Thanks to generous bidders, the pieces brought a significant contribution for the scholarship fund."

WALNUT, 31D X 28W X 59H

Photo: Pennsylvania College of Technology

## MICHAEL CODISPOTI
Wellesley, Mass.

"I wanted to make a coffee table that was beautiful, yet simple, and let the wood speak for itself." Codispoti used Charles Durfee's bow-front table (*FWW* #204) as inspiration. "I had never done any bent lamination before and this seemed like a great place to start, except that I wanted a bow on either side, since it is a coffee table and will be viewed from all sides."

MAHOGANY, POPLAR, MAPLE, 24D X 52W X 18H

## Submissions

The gallery provides design inspiration by showcasing phenomenal work. For submission instructions and an entry form, go to FineWoodworking.com/rg.

## MEL MONTEMERLO
Burke, Va.

This carved mirror frame was done in a style known as "Norwegian Acanthus," which features deep, flowing acanthus vines. Montemerlo spent two years learning the basics of this type of carving. "No one in the local guilds had ever heard of this style, and there are no pieces in this style in area museums." Not only that, but his wife wanted something to hang on a wall, as his home is already full of furniture.

BASSWOOD, 1⅝D X 19½W X 31½H

## KENNETH FREDERICK
Kansas City, Kan.

Frederick wanted a pair of tables to fit into the corners of his dining room. After sketching the design and finding the veneer for the top, he acquired some quartersawn 8/4 teak for the legs. He laid out the curved legs using a flexible MDF batten and some finish nails, and added a radius to the front edge of the triangular top "to make it interesting." The edging is teak, too.

TEAK AND CAMPHOR BURL VENEER, 17D X 28W X 26H

Photo: Hollis Officer

## JOHN G. EUGSTER
Las Vegas, Nev.

When designing this Shaker-inspired armoire, Eugster wanted to avoid a large, monolithic appearance. It was a complicated build, with lots of hand-cut dovetails, mortise-and-tenons, frame-and-panels, and drawers (complete with wooden runners). "I have the reputation of being the hand-tool guy, and this piece is no exception." Eugster documented the build on his blog at woodworksbyjohn.com.

MAHOGANY, MAPLE, ALDER, WALNUT, 19D X 48½W X 74H

Photo: Diane N. Eugster

## MICHAEL KAPLAN
Santa Fe, N.M.

A longtime practitioner of Japanese martial arts, Kaplan calls this his "bokken" table because the five-sided, hand-shaped legs resemble the wooden practice swords of the same name. "The five-sided leg was something I've wanted to try for a while, and it was a good opportunity to use some beautiful wood I've had stashed away."

MAHOGANY AND TZALAM, 10½D X 13W X 32H

## JAMES McINTYRE
Millis, Mass.

This corner cupboard is an example of how inspiration can strike at any stage of a project. "As I worked, the curved fronts of the shelves and wavelike curves of the crown molding suggested a nautical feel, which inspired me to make the sailboat finial."

MAHOGANY AND POPLAR,
19D X 42W X 84H

## ROB WILCOX
Coulterville, Calif.

Wilcox made his first Swedish bentwood box for a gift exchange while a student at the College of the Redwoods. "The inspiration came from a crudely made box in our home. I believe it had been made by one of my great grandfathers, both of whom were Swedish carpenters. I modernized the style and gave it a more refined look overall."

WHITE OAK, 7¼W X 12L X 4½H

## EVAN COURT
Charlestown, Mass.

Court, a studio furniture maker, has been focused lately on delicate and sculptural pieces. "The wavy facade is a theme I like very much. I find there is unseen movement all around us and I like trying to capture that through fluid, seemingly arbitrary curves." The rotating drawers were originally inspired by a Thomas Seymour commode. "They were necessary due to the shape of the piece, but are also great fun to operate."

CHERRY, POPLAR, MACASSAR EBONY, 16D X 32W X 36H

Photos: Alex Jaynes

## CHARLES MAXWELL
Pittsford, N.Y.

This is the 10th all-wood clock Maxwell has made since he retired from the Navy in 2006. He saw his first wooden clock in 1982 and promised his wife he'd build her one someday. "She chuckled at the thought," he says. Twenty-five years later she got her clock. The clock shown here was made as a wedding gift for his daughter. The pendulum bob is formed into a circle to symbolize unconditional love.

WHITE OAK AND MAHOGANY, 18D X 22W X 72H

Photo: Robert Steere

## PETE RODIN
Peterborough, Ont., Canada

Rodin worked on this table nights and weekends while serving as a full-time shop assistant to Michael Fortune. The Art Deco style inspired the general look of the piece, and a flower blossom inspired the curves and the two tones of wood in the curved base, with the curly maple on the inside. "Working alongside Michael for the past year has opened my eyes so much to the methodical steps that are required to bring a design concept to fruition."

WALNUT AND CURLY MAPLE, 24D X 24W X 38H (GLASS TOP 38 DIA.)

# Sleek-looking recessed pulls

BY BRIAN HUBEL

Early in my career, after finishing off a piece of furniture with store-bought pulls, I felt something was missing. Pulls can be a powerful design element, and I realized the hardware was a lost opportunity to design and create something unique and more fitting to the piece.

As my furniture style developed, I came up with this recessed pull design, which is clean and sleek to my eye, and adds a contemporary feel. With their low profile, these pulls are particularly useful for sliding doors or interior drawers, but they can work almost anywhere. The recess can be almost any shape, and can go partway or all the way through. It can also be shaped or sculpted—I sometimes cut free-form recesses and pair them with a curved finger hold. And the finger hold can be horizontal or vertical, centered or skewed to one side.

Using a simple router template with a guide bushing, I create both the round recess and the groove for the finger hold in one shot. To be sure that the pulls end up in precisely the right spot, it is best to rout them after the door or drawer is made and test-fitted to its opening.

### Start with a drawing and template

The first step is to get a full-scale design onto paper and then attach it to a ¼-in.-thick MDF template. Remember to allow for the router bushing offset. For this pull I used a ¼-in.-dia. bit and a ⅜-in.-dia. bushing, so I drew the circular hole for the template ⅛ in. larger in diameter than the central recess I wanted in the pull.

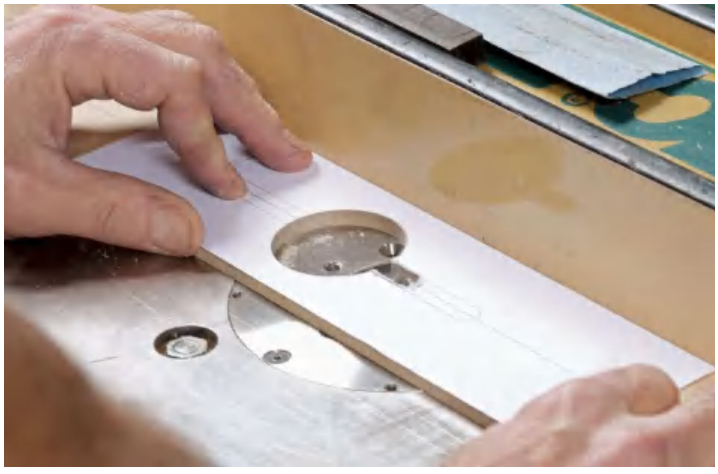
In addition to the recess, I laid out the groove for the finger hold. I like the look of a ¼-in.-thick finger hold, so I drew out a straight ⅜-in.-wide groove, which will keep the bushing on track with no wandering.

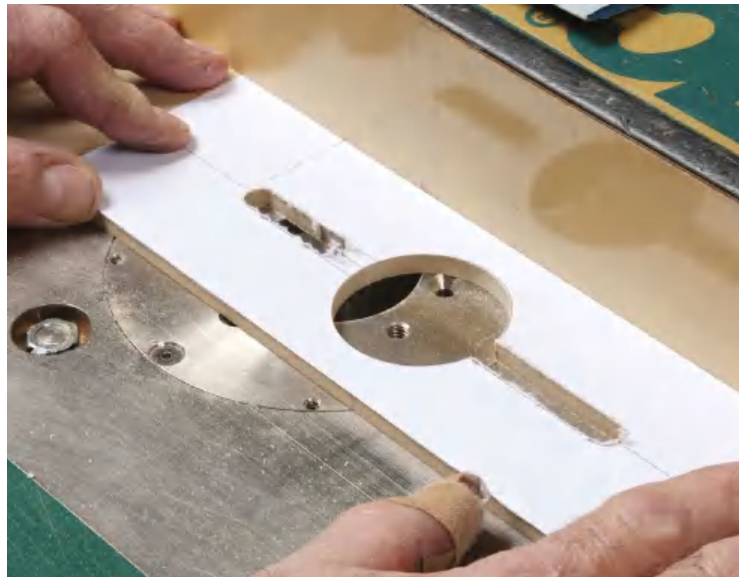


Photos, except where noted: Asa Christiana; this page: Don Jones

## Make the template

***Cut the recess first.*** *Hubel generates most of his pull designs in a CAD program, and glues a printout to ¼-in. MDF (left). With pulls with a round recess, Hubel drills the template (above), but for ovals and other designs, he uses the scrollsaw, and sands the opening smooth.*





***Finish at the router table.*** *For the right-hand slot, start in the recess (above). But to keep the router action working in your favor, start the left-hand slot with a plunge cut at the end, and rout toward the recess (right). Mark the table's fence to know where to start this blind cut.*

To help align the template on the workpiece, I add centerlines to the drawing that extend to the edges. I usually include the edges of the door stile or drawer front on my drawing, to help with alignment but also to preview the final look. When locating the pull, don't forget about any internal joinery that may get exposed when cutting the recess, like the groove for a door panel or drawer bottom.

I make the template the same size as the drawer front or door stile to make alignment and clamping easier. I attach the drawing to the MDF with liquid hide glue. It has a quick tack without the mess of spray adhesives.

I drill a hole for the circular recess using a Forstner bit. For an oval or free-form recess, I turn to the scrollsaw.

After cutting the recess, I rout the straight slots in the template using a router table and a bit the same diameter as the bushing.

### Foolproof routing

With the template in hand, I next determine the depth of cut in the workpiece. In general I rout the recess and slots at the same depth, using an upcutting spiral bit, which evacuates chips well and makes a very clean, smooth cut. I clamp the template to the door or drawer front and start routing at the end of one slot, move into the center of the recess, and work my way outward in a counterclockwise motion. To make the outside burn-free, leave just a whisker at the edge, and do one quick final pass with the bushing tight against the template. Then continue to the end of the other slot.

Dust collection helps a lot. Without it, chips will get packed in the recess, making travel difficult, especially in the slots. Make sure dust has not compacted

## Rout the recess

Hubel uses a ¼-in. spiral bit combined with a ⅜-in.-dia. bushing to rout the recess.

***Set the depth.*** *With the template clamped in place, lower the bit against the workpiece. Then set the depth stop, using a spacer equal to the desired depth of cut.*

***Almost foolproof.*** *Use dust collection if possible. Start at the end of one slot and move into the middle of the recess. From there work outward, cutting in a counterclockwise circular path. To avoid burn marks at the edge of the recess, leave a whisker of material there for a final pass. Then finish the other slot.*

into the ends of the slots, preventing the bushing from traveling the full distance.

After routing, I do some cleanup with sandpaper to remove any router marks. After that I ease the edges of the recess to eliminate sharp corners. If the rounding is minimal, hand-sanding will take care of it. For a more pronounced roundover, I use a tiny roundover bit with a brass pilot instead of a bearing at the tip. Bearing-guided bits tend to bottom out in the recess.

### Insert the finger hold

The finger-hold thickness matches the slot generated in the routing process, in this case ¼ in. The ends of the slot can be squared off with a chisel, or you can curve the ends of the piece to match the ¼-in. diameter of the router bit.

If the finger hold will be significantly proud of the surface (unlike this one), you can notch its ends so the top extends slightly beyond the slot, making the fit a little more forgiving.

Before I glue the finger hold in place, I generally prefinish it. If you wait until after it is assembled, the piece will be hard to finish cleanly. PVA glue won't work on finished surfaces, but 5-minute epoxy and cyanoacrylate (Super) glue both work great. Be stingy with the adhesive, as squeeze-out is difficult to clean up in the confines of the recess. □

*Brian Hubel is a professional furniture maker (BrianHubel.com) in Colorado Springs, Colo.*

***Install the pull.*** *A folded piece of sandpaper is the best tool for removing burn marks in the recess and breaking its sharp edges (right). Pre-finish the parts and then use epoxy or CA glue to secure the finger hold (far right). Apply a small amount in the slots only, to avoid squeeze-out.*

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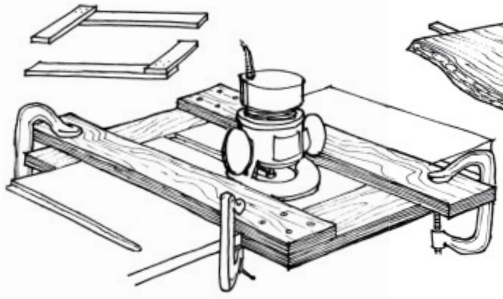
looking back

# Hundreds of jigs and one fixture

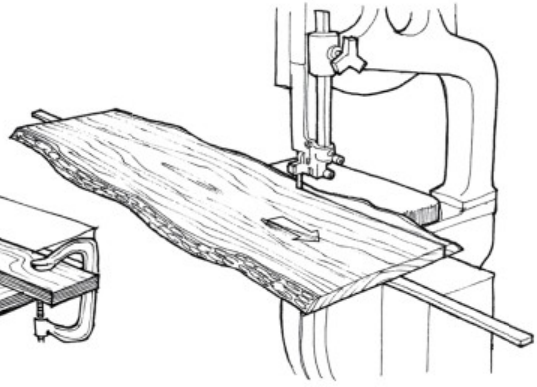
BY ASA CHRISTIANA

***Shop-tested.*** *Jim Richey rebuilt hundreds of reader jigs and fixtures over the years, to make sure they worked and to find the best angle for drawing them.*

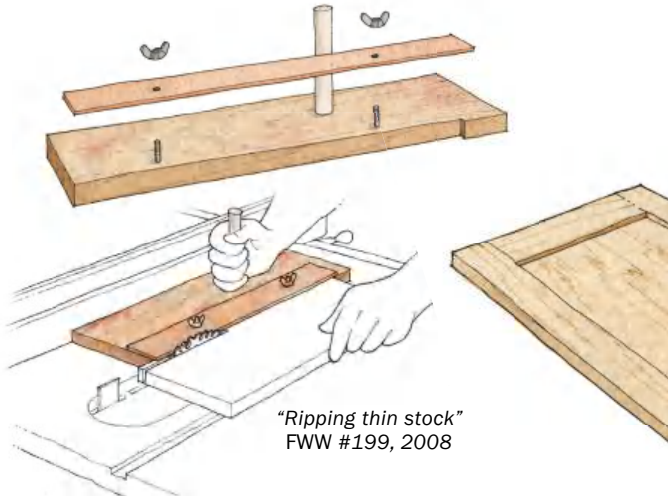
## 40 YEARS OF TIPS



*"Jig for cross-grain routing"*
FWW *#17, 1979*



*"Ripping crooked stock on the bandsaw"*
FWW *#114, 1995*



*"Ripping thin stock"*
FWW *#199, 2008*



Photos: Asa Christiana; drawings: Jim Richey

After editing and illustrating the Methods of Work column for 36 years, Jim Richey bows out gracefully with this issue, as gracefully as he has handled the job from the beginning. It is striking that he steps down at a major *Fine Woodworking* anniversary, not only because of the extraordinary length of his tenure, but also because of the way his story has paralleled the magazine's.

Richey was with *Fine Woodworking* from the beginning, filling out the first promotional mailer in time for issue #1, and answering the call to submit articles soon after. Recognizing his talent and passion, the magazine named Richey one of its earliest "correspondents," charged with reporting and writing about woodworkers in his neck of the woods (Houston at the time). After seeing a treadle lathe demonstrated at a craft fair, he got permission from the turner to draw up plans and submit them to the magazine. By issue #16, Richey's expert drawings and tips had landed him the newly minted Methods of Work department, which he then edited and illustrated at an unwavering level for nearly four decades.

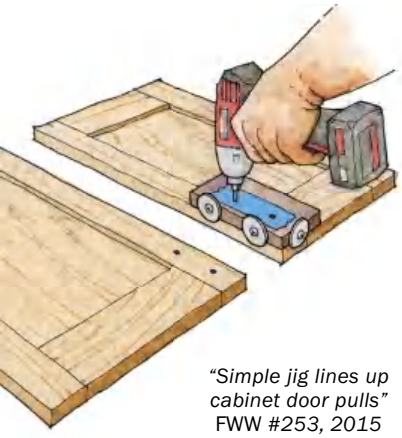
As his editors came and went, as black and white became color, as paper and post were replaced with email and Dropbox, even after he retired from Conoco and moved back to his little hometown of Alva, Okla., Richey worked tirelessly to make the column great, starting with picking the best tips from the pile and corresponding with contributors to be sure he understood each one fully, and then figuring out how best to draw them.

"Every building is built twice, first in someone's mind and then with bricks and mortar. I do that with every tip," Richey says. For trickier tips, Richey built mock-ups in his own shop, photographing them from different angles and using the best images as the basis for his drawings.

> ***"Every building is built twice, first in someone's mind and then with bricks and mortar. I do that with every tip."***

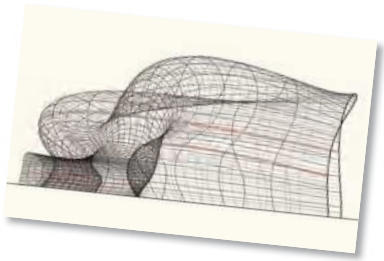
While he is choosing his moment to step off stage, Richey says it feels a little strange to walk away. "Methods of Work was built into my calendar for 36 years. But it will be nice to make travel plans now and not have to worry about that schedule." □

*Asa Christiana is a freelance writer and editor in Portland, Ore.*



*"Simple jig lines up cabinet door pulls"*
FWW *#253, 2015*

# Built like a boat



BY JONATHAN BINZEN

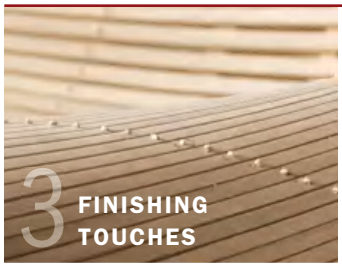
In Matthias Pliessnig's seating pieces (see the back cover), structure and surface are fused. He brings boatbuilding techniques to his furniture, creating for each piece a steam-bent skeleton overlaid with steam-bent slats, or stringers. He develops the designs on the computer in Rhinoceros, a 3-D modeling program, which, with its draping grid of lines representing compound curved forms, is a perfect corollary to the latticework of ribs and stringers in his furniture. When Pliessnig has a shape he likes on the computer, he takes slices through the drawing and uses those section views as templates for the plywood ribs that are the starting point of the physical structure.

***Sketching the structure.*** *Pliessnig roughs out the sofa's form with temporary ribs and stringers. The ribs, jigsawn or CNC laser-cut from plywood, are fixed to a plywood strongback that snakes along the centerline of the piece providing a level surface. The temporary "sketching stringers," steam-bent from white oak, let him "play with the shape to make it more attractive or more usable."*

***Partway there.*** *Pliessnig uses temporary stringers as a mold inside which he can bend temporary oak ribs to shape. After bending final stringers to the temporary ribs, he replaces the ribs with final ones.*

***Steaming the stringers.*** *Pliessnig steams and bends the stringers one by one, clamping them in place overnight. Then he'll remove one, sand it, and glue it in place with epoxy. For extra strength, he makes every third or fourth rib thicker.*

***Smooth stringers.*** *Pliessnig hand-scrapes the entire piece to achieve a smooth, fluid surface across the stringers.*




***Pegged in place.*** *With hundreds of face-grain glue joints between ribs and stringers, the structure is extremely strong; but for added insurance Pliessnig pegs the stringers into the heavier ribs. For pegs he uses bamboo skewers—one skewer yields 10 to 12 pegs.*

***Final smoothing.*** *When all else is complete, Pliessnig sands the piece inside and out with a Mirka random-orbit sander, stopping at 220 grit on the inside of the structure and 320 grit on the outside. Then he applies three to five coats of Minwax Wipe-On Poly.*

Photos: Matthias Pliessnig

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# Sinuous Seating

When Matthias Pliessnig first began working wood, he found the craft, with all its dangerous tools and rigid rules about wood movement, utterly frustrating. The first table he made was such a failure that he took it on a camping trip and used it as firewood. Furniture itself was not a natural draw for him, either: Hadn't everything possible already been built? Did the world really need more furniture? Then one summer he decided to build a boat—an ultralight Montfort Classic 12 skiff. Essentially a steam-bent ribcage with a translucent skin, it weighed 30 lb. but could carry four grown men. He fell in love with the form, and he immediately saw that he could apply the same structural and steam-bending techniques to furniture. In the 10 years since, Pliessnig has perfected a painstaking process of steam-bending white oak ribs and slats to produce some of the most beautiful forms in contemporary furniture. These days, as he works in his shop in Brooklyn, filling orders from across the country and well beyond, it seems clear that yes, the world did need more furniture.

*—Jonathan Binzen*

Photos: Matthias Pliessnig

**How They Did It** Turn to p. 90 to see the inner workings of Pliessnig's intricate steam-bent structures.

See more of Pliessnig's work and hear him discuss how he designs and builds it.